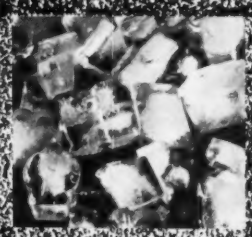
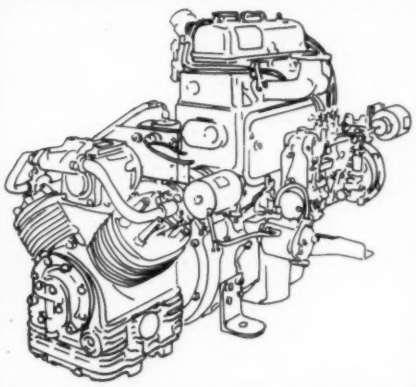
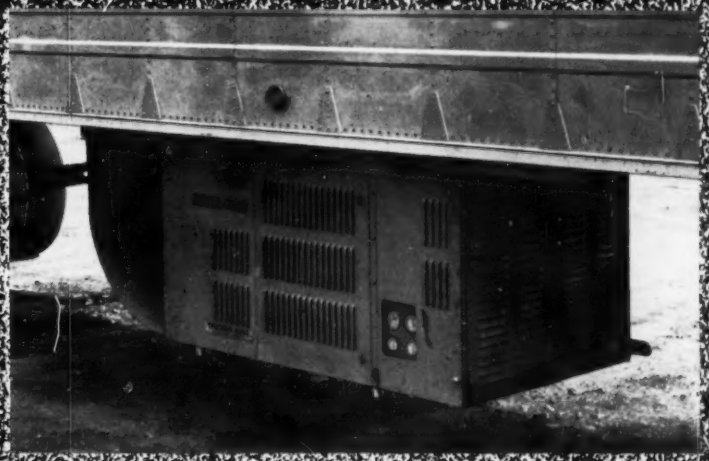
diesel power

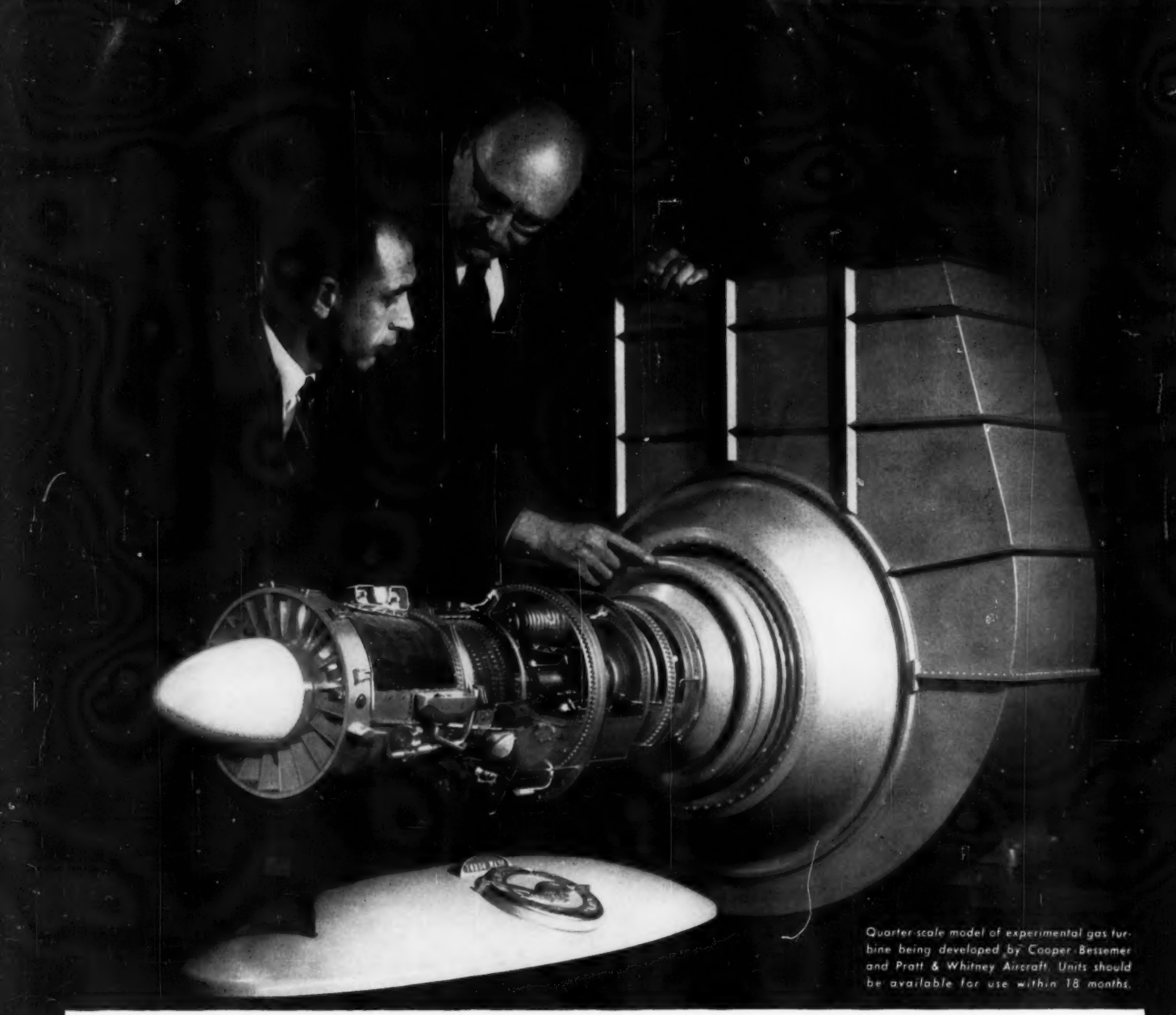
November 1959





A LOOK AT TODAY'S TRUCK REFRIGERATION





Quarter-scale model of experimental gas turbine being developed by Cooper-Bessemer and Pratt & Whitney Aircraft. Units should be available for use within 18 months.

How Cooper-Bessemer is teaming up with Pratt & Whitney Aircraft to develop JET TURBINE POWER for industry

The cutaway model shown is a revolutionary new concept in gas turbines. The generating unit is a new Pratt & Whitney Aircraft jet engine—a modification of the famous J-57 aircraft engine, designed for gas fuel. The companion power unit is a new Cooper-Bessemer power turbine. This combination, now in the advanced experimental stages, represents the hottest development in industrial power in 20 years. It will mean drastic economies in installations of engine-driven compressors, generators and other rotating machinery.

For example, in gas compressor stations, it is expected to reduce total station cost by 50%!

Plans call for this new gas turbine to be available for broad application within 18 months. In the meantime, watch for reports on further developments in this pioneering teamwork by Cooper-Bessemer and Pratt & Whitney Aircraft.

BRANCH OFFICES: Grove City • New York • Washington • Gloucester
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Toronto • Halifax
C-B Southern, Inc. . . . Houston
Cooper-Bessemer International Corporation... New York • Caracas • Mexico City
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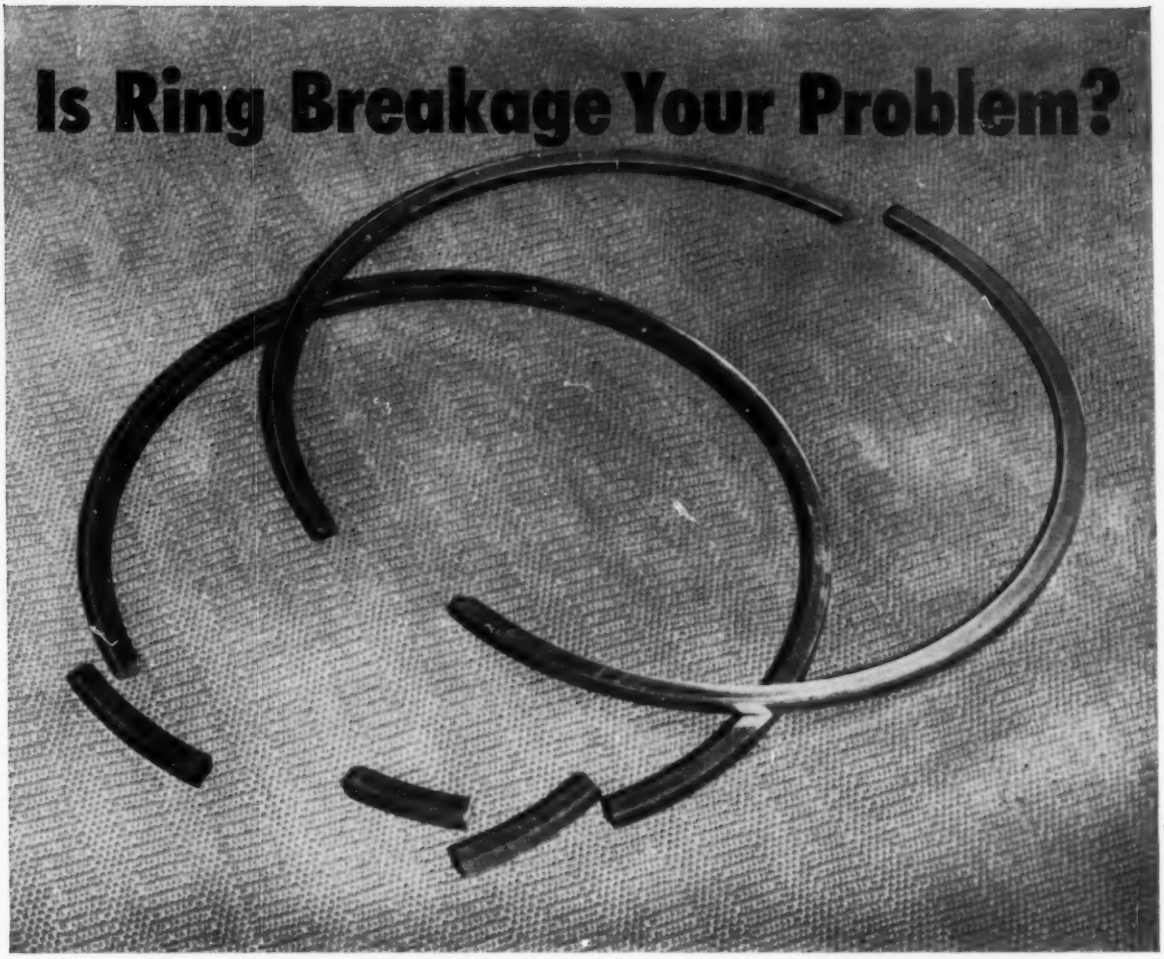
Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS - DIESEL - GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL
ENGINE, TURBINE OR MOTOR DRIVEN

Is Ring Breakage Your Problem?



Ring breakage in engines is a real . . . and *costly* problem. It results in:

- **poor performance**
- **costly downtime**
- **increased maintenance expense**
- **subsequent damage to other engine parts.**

To combat this problem, Pedrick developed the remarkable "Excelloy" piston-ring alloy—an amazingly-strong, centrifugally-cast, heat-treated material with a dense, uniform structure. It combines toughness and resiliency with a very high tensile strength and resistance to heat—characteristics essential to avoid ring breakage.

So, no matter what your type of engine or service, ring breakage will be practically eliminated when you use Pedrick rings made of high-strength Excelloy.

Write now for descriptive catalog and prices. Use Pedrick's experienced engineering service for consultation on all your piston-ring problems. Wilkening Manufacturing Co., Philadelphia 42 and Toronto 2.

Pedrick

PISTON RINGS

Our 41st Year of Specialization in the Design and Manufacture of Piston Rings

Twin Disc Single-Stage Torque Converter (left) proves its merit in record-breaking ditch cleaning job.

7 CYCLES A MINUTE
for torque converter-equipped Marion 35-M Dragline

Canton, Ohio truck farmers recently hired Don Lowe's Dredging & Excavating Co., Loudonville, Ohio, to clean out their drainage ditches. Loose dirt had filtered into the ditches, gradually closing them up and severely reducing their effectiveness.

Almost 10,000 feet of ditches 10 to 12 feet wide needed cleaning, and three feet of muck had to be removed from the bottom of the cuts.

The entire job was done with one machine—a newly purchased Marion Type 35-M Dragline with a one yard bucket. Powered by a Cummins J6B1 Engine, this unit drives through a Twin Disc Single-Stage Torque Converter. With a 45° swing the dragline completed seven cycles per minute—*less than nine seconds per load!*

Let Owner-Operator Don Lowe tell why he likes to work with torque converter drive: "The converter really smooths out the cycles. I get exactly the torque I need for digging, hoisting or swinging, and the engine never lugs down. It's a lot faster, and a lot easier to handle too."

Marion and almost every other excavating equipment manufacturer offers the Twin Disc Torque Converter as standard or optional drive. When you specify a Twin Disc Converter in your crane or shovel, you get the same converter that boosts production and profits in your crawler tractor. It's the best investment you can make when buying heavy-duty machinery. Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

TWIN DISC

TWIN DISC

Torque Converters

NEW FRAM DOUBLE CARTRIDGE AIR FILTER GIVES DOUBLE SAVINGS!

Cuts Cartridge Costs *Cuts Maintenance Costs*

Now FRAM offers—for extremely dusty conditions—a new line of heavy-duty dry air filters with *precleaner* cartridges that give your engines complete dust protection—at great money savings!

These new filters utilize the famous FRAM "Filtronic" Cartridge with additional precleaner cartridge protection.

Tests show that *three of these inexpensive precleaners* can be used during the life of each FRAM "Filtronic" Cartridge! This means triple life for the main cartridge . . . fewer "Filtronic" cartridge changes . . . a new low in cartridge costs! This new filter is so efficient that even under abnormal dust conditions it assures long engine life . . . fewer engine overhauls.

FRAM supplies a complete line of these heavy-duty filters—to meet air intake needs of engines requiring from 225 to 1000 CFM! For complete information, write FRAM CORPORATION, Providence 16, R. I.

HOW IT WORKS

1 *Dirty air* enters perforated grill. 2 It passes through precleaner cartridge which removes soot and fine dust. 3 Air then continues to inner main "Filtronic" cartridge which removes 99% plus of all other impurities. 4 Clean air then leaves the filter and enters the engine air induction system.

FRAM
OIL AIR FUEL WATER
FILTERS

General Motors Reliability in Action...

Mechanical Blizzard!

Harrison Heat Exchangers —Reliable Products of General Motors Research and Engineering.

HARRISON COOLS OIL FOR DIESEL-POWERED SNOW MACHINE THAT PRODUCES 10-INCH SNOWFALL IN AN HOUR

Snow is made to order for perfect skiing all winter long at Mt. Christie in Michigan. Water and compressed air are mingled and distributed as a fine spray through a series of sprinkler heads. By this method a 24,000 sq. ft. area can be covered with a ten-inch snowfall in an hour! And this Diesel-powered snow machine counts on Harrison heat exchangers to control vital operating temperatures. That's because Harrison, with a half century of experience in the heat control field, builds reliability into every product. So, if you have a cooling problem, rely on Harrison for the answer.

GM HARRISON

TEMPERATURES MADE TO ORDER

AIRCRAFT, AUTOMOTIVE, MARINE AND INDUSTRIAL HEAT EXCHANGERS

HARRISON RADIATOR DIVISION, GENERAL MOTORS CORPORATION, LOCKPORT, NEW YORK

editors notes...

You'll want to read about...

Diesels proving a reliable source of power for today's mushrooming refrigerated truck business . . . here's what's involved from three viewpoints—user requirements—sales and service, both backed by a product . . . another diesel-powered product (Pg. 18) . . .

EMSA . . . Equipment Maintenance Supervisors Association going national. DIESEL POWER can help you get a chapter started in your area . . . such associations are important to the whole industry . . . need all the support they can get and we want to hear from anyone interested . . . the story is on page 23 . . .

Dale Oman of S. J. Groves & Sons Co. is Today's Diesel Man . . . supervisor of maintenance for one of the big ten in the heavy construction field . . . a story of ingenuity, solid know-how and technical knowledge that adds up to the ability to keep the equipment working (Pg. 26) . . .

RoosaMaster has an exciting development in pedal-to-pump linkage, a new hydraulic control that gives positive, precise control . . . is new, its easy to install—find out about it on page 28 . . . .

Maine Public Service has put a GM transportable, diesel-electric peaking and reserve plant to work . . . a turn-key unit, this push-button-operated generating plant offers exciting application possibilities . . . (Pg. 33) . . . .

You'll want to read about...

Deutz diesels, now sold through Chrysler's Marine and Industrial Engine Division, were studied at Chrysler's Rye, N. Y. Training School . . . first of a two-part series on the introduction of these engines to the American market . . . the second part, to appear in January, will hit sales and merchandising . . . (Pg. 38)

Behind Hercules new engine line is a management concept . . . and a market awareness that brings a "new look" to diesels . . . the target is trucking, all the way down to pick-ups . . . (Pg. 38) . . . . .

A new approach to explosion relief valves in the fight to eliminate crankcase explosions . . . a light-weight flap-type valve loaded by a double coil spring gives good results, read about it on page 40.

Countershaft inertia brakes . . . they solve a specific problem — making upshifting, in cases where deceleration of heavy vehicles is faster than engine deceleration, a much easier deal. Want to give your operators a break? . . . find out about Fuller's inertia brakes on page 35 . . . .

Don't miss the "hot line", a last minute news approach to industry highlights . . . this month a talk with sales executives of engine companies . . . . . Advertisers in our industry pay for the space they use in this magazine . . . their products are aimed at helping you to do a better job, faster and for less money . . . get the ad reading habit and remember that the right equipment backs up good management and a job well done.

ESTABLISHED IN 1923
NOVEMBER, 1959 VOL. 37 NO. 11

diesel power

EDITORIAL

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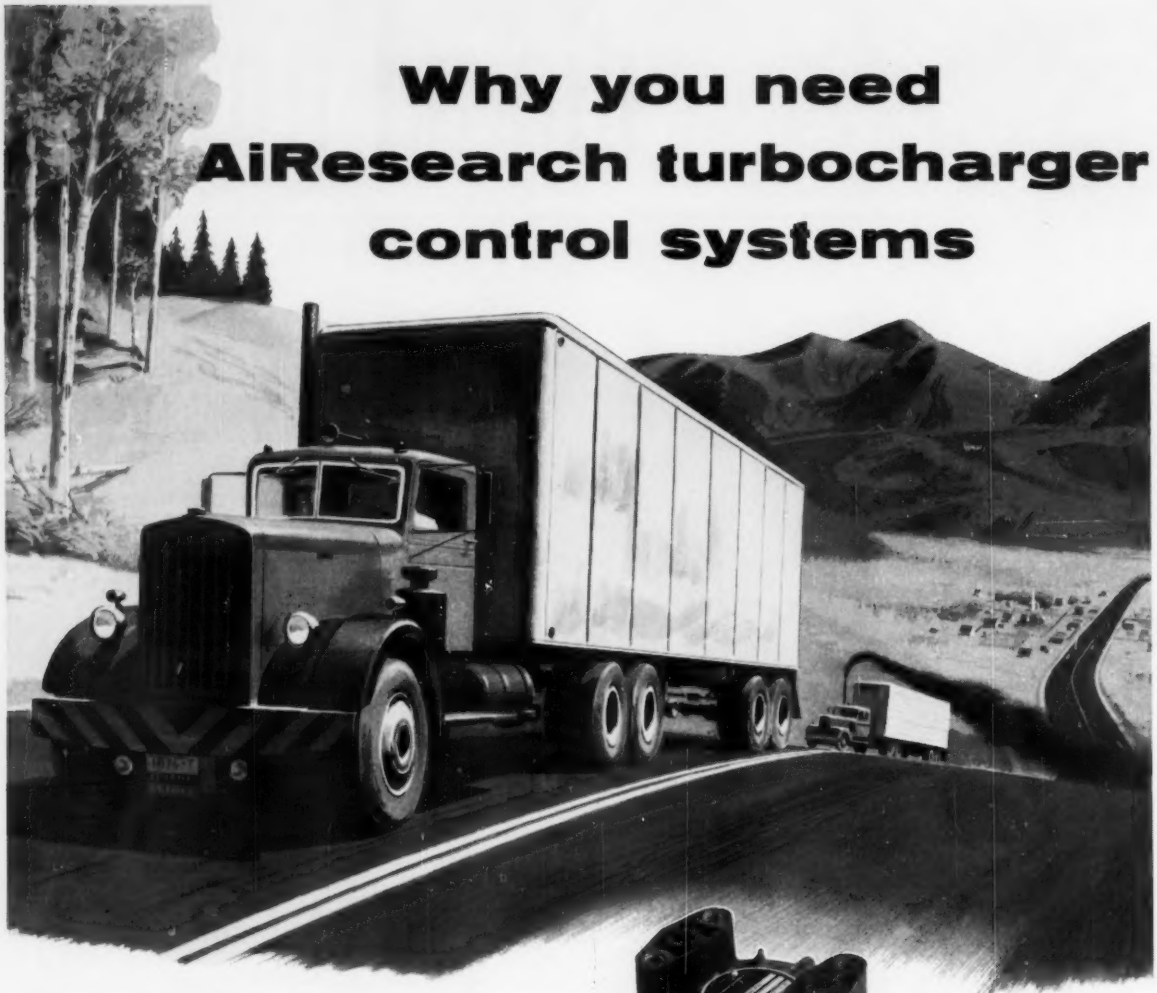
BPA

Why you need AiResearch turbocharger control systems



The two components of the AiResearch turbocharger control system are a speed sensor and an exhaust by-pass valve. They control the speed of exhaust-driven turbochargers by modulating the amount of engine exhaust used.

The AiResearch turbocharger control system delivers more air to the turbocharged engine automatically when needed. This more than doubles the torque rise and gives the engine much greater lugging ability under heavy loads.

AiResearch is the leader in the development and production of turbocharger controls for all major diesel engine applications as well as air-cooled turbochargers for diesel engines from 50 to 700 H.P. Your inquiries are invited.

Reduced fuel consumption

•

Smoking eliminated

•

Longer engine life

•

Lower maintenance costs

•

Shorter running time

•

Better engine lugging

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

diesel power

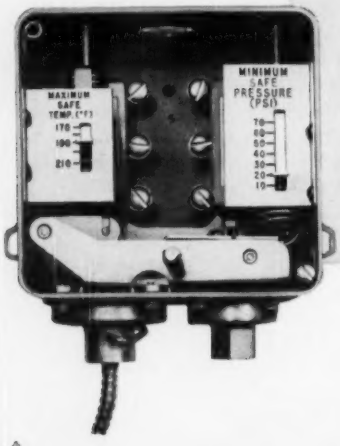
editorially speaking

About Multi-Fuel Engines . . .

The crop of multi-fuel engines from both sides of the Atlantic is growing. We're talking now of engines that will burn, without modification, a fuel range from the lighter and hard-to-ignite gasolines through the distillates to No. 2D or heavier fuels. MAN's "Whisper" engine was one of the first, and now we have Continental's version of this same basic design. Deutz has an air-cooled multi-fuel engine. Hercules has just announced its "Polydiesel." Attention is being given to further development of the omniverous Texaco Combustion System. Why all this multi-fuel interest? First let's recognize that tremendous good can come out of the intensive combustion chamber research involved, even if conventional fuel is to be burned. Next, multi-fuel capability has immediate appeal for military applications. We know from personal World War II experience of slightly heroic logistical efforts to insure a supply of a specific fuel and of tactical delays resulting from absence of such fuels. We'd have given a lot for multi-fuel capability. Is this the end? We're beginning to wonder. For example, many diesels in ground support service are currently running on normally-waste jet fuel—cleaner-up tank drainings, etc. How many other cases are there where a cheap or for-free oddball fuel might be used? We don't know, but we bet there are many. Such items as cost of duplicate storage and dispensing facilities, relative quantities of different fuels purchased, or even product availability could make fuel flexibility an important economic factor. Then, when our predicted diesel expansion materializes, what effect will it have on fuels? Oil companies do a terrific over-all job of balancing products to demands. But they must get, and are entitled to, a return on each barrel of crude refined. If the ratio of products varies to suit all industry requirements, so must costs. We won't presume to predict future patterns—it's a job for specialists. We only say that increasing competition for different petroleum products could alter availability and cost patterns as we know them now. And multi-fuel capability could be economically important. It's something to think about and watch.

B. P. E.

Temperature and pressure set points are inside the case, protected against accidental manipulation. Cover is removed for easy adjustment.



NEW

Diesel engine safety switch

...gives fail-safe protection

This all-new Honeywell safety switch responds to abnormal pressure or temperature to stop or idle a diesel engine, or actuate an alarm circuit.

It combines separate systems for measuring engine coolant temperature and lubricating oil pressure. The temperature system includes an exclusive fail-safe feature, so that in case of damage to its temperature bulb, capillary or diaphragm, the switch responds as it would to excessive temperature.

Temperature and pressure settings can't drift off set points. There can be no false shutdowns due to vibration. Set points are easily adjustable in the field.

Your nearby Honeywell field engineer will be glad to give you complete information about the new Diesel Engine Safety Switch. Call him today . . . he's near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

First in Control

● **REFERENCE DATA:** Write for Specification sheet S1010-5 "Diesel Engine Safety Switch."

diesel power news section highlights

HOT LINE - A LAST MINUTE TALK WITH SALES EXECUTIVES . . .

Big news is in repowering . . . the time is right for the diesel industry to make its big move . . . and things are happening — here's how it looks at . . .

DETROIT DIESEL

A current mailing piece aimed at repowering business tells the story of a Dodge Model 600 repowered with a 4-53, averaging 11.5 mpg . . . replies are coming in strong already . . . GM was aiming for the light truck market with much of their new engine line and has a program involving use of all media and personal contact which is developing a terrific small truck market . . . reports OEM doing well, a good sales picture in general and the curve is headed up . . .

HERCULES

Right up to press time we've been getting calls from Wall Street from investors stirred up over the potential of Hercules' new engine line and their general corporate position in the industry . . . repowering is the hot story here backed up by broad industrial application . . .

CUMMINS

"Stop-and-go" trucking is the target for Cummins . . . they report that the C-160 engine is hitting the repowering field in a big way, and that they are working down into the light vehicles . . . an International Travelall for example . . . and their Los Angeles distributor has repowered a pick-up with the C-105 engine and it is giving the owner everything he expected . . . Cummins is talking about the future of the tandem market, citing the tests in Kansas as something to watch . . . they've just filled a government order for 800 45-kw units and have other precise-power markets which will be making news.

OTHER APPLICATIONS LOOKING EQUALLY HOT . . .

There was a good word for other important diesel markets . . . FORD IMPLEMENT AND TRACTOR DIV. told us "a diesel success story. . . . Ford broke the diesel cost barrier in March 1958 when it introduced a 172-cu in. 44-hp tractor engine at about half the customary price differential over gasoline engines . . . followed this year with a 144-cu in. engine producing 34 hp at a similar price advantage . . ." Ford produces about 20 per cent of the wheel-type tractors built in the U. S. and they now report their penetration of the diesel market is substantially higher than this figure and is continuing to rise

MORE NEWS HIGHLIGHTS FOLLOW ►

NEWS SECTION HIGHLIGHTS . . .

ALLIS-CHALMERS

Overall sales picture looks good . . . reception of both the 16,000 and 21,000 engines has exceeded expectations . . . applications include off-highway trucks, water pumping units, marine installations and crushing plants. Materials Handling Division reports a good market for their new diesel Stevedore model forklift . . .

WAUKESHA

New engine is still in the lab being tested, it features telescopic valves . . . should make real news when it goes into production . . . sales picture is strong with oil industry and construction fields leading the way . . . relatively new in the standby engine-generator field, Waukesha looks to a continued increase here . . . also doing well, with a good number of installations completed recently, the marine field.

FORD INDUSTRIAL DIVISION

Sales doing well with volume split about evenly between two growing markets — marine and irrigation . . . feeling the swing to diesel with repowering work showing growth . . . also in their marketing picture heavy industrial and agricultural equipment.

INTERNATIONAL HARVESTER

New family of lightweight, high-speed engines being expanded by two new ones, the D-252 and the D-301. These are described as sleeveless versions of the D-236 and the D-282 respectively . . . and they are aimed at the automotive field with low initial cost as a wedge into light truck application . . . this could be a big breakthrough for IH . . . take an example, a D-301 turning out 110 maximum hp at 3000 rpm . . . it weighs only 860 pounds, is installed in a city pick-up-and-delivery "cab forward" unit . . . also installations in vehicles down to 3/4-ton pick-ups reported doing well . . .

WE ASKED ABOUT THE STEEL STRIKE . . .

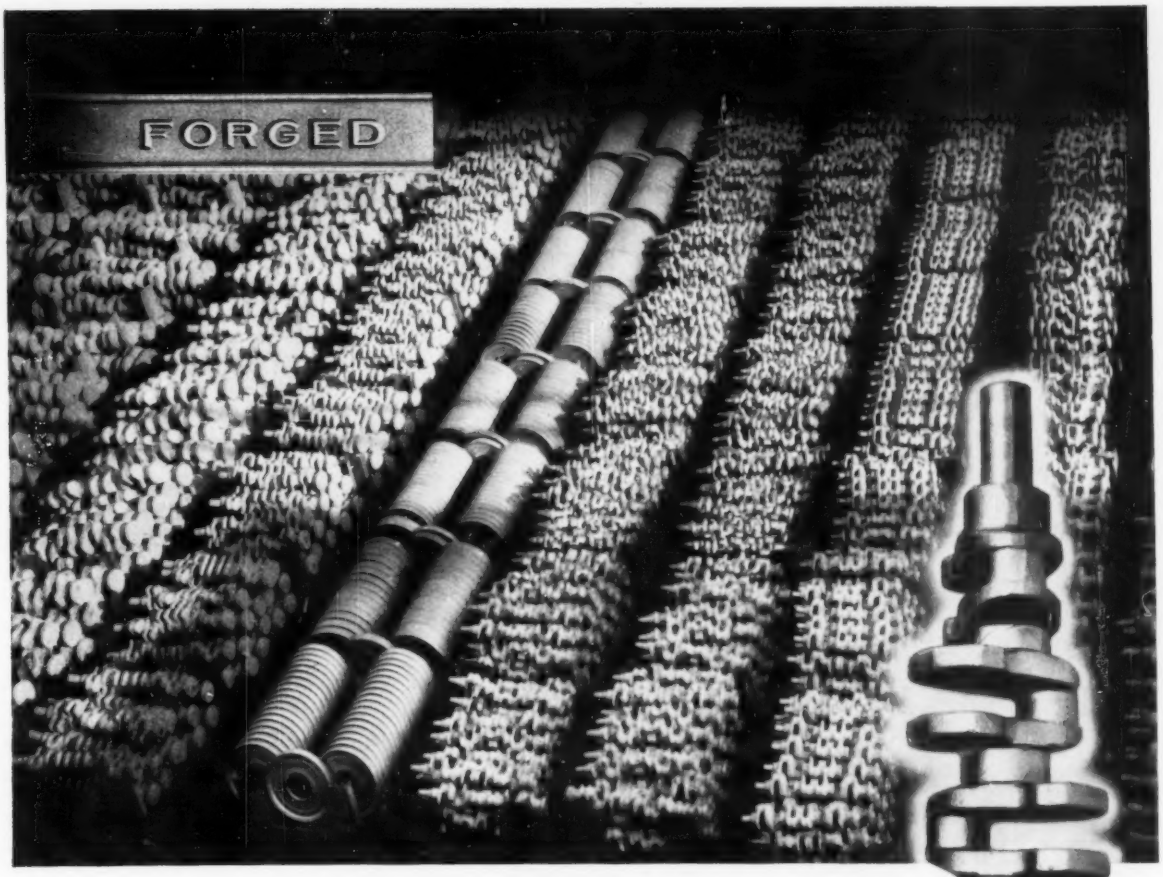
Just about everyone is in good shape for another month — but after that, things will really start to tighten up. Already some firms report that their bigger customers are starting to hold up. Cummins noted that they are in good shape for the fourth quarter and have been buying abroad for the first and second quarter of next year.

WHAT'S AHEAD . . .

Diagnosis — industry's pulse is running a little fast, health is excellent. Sales are generally up — and will continue to climb. Look for a lot of repowering news; more government contracts, with "precise power" high on the list; continued penetration into the farm tractor field; some big irrigation stories; a good standby and pipeline market.

Next month we'll be talking with 6 key distributors across the country.

MORE INDUSTRY NEWS FOLLOWS ►

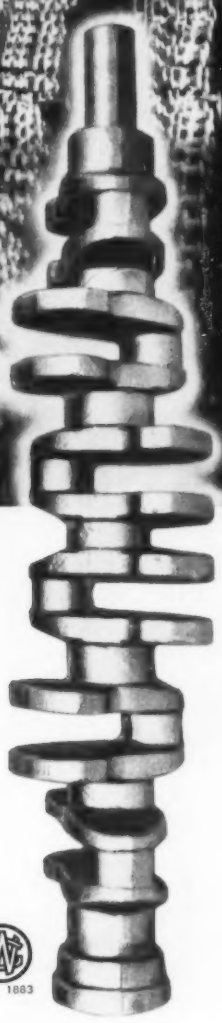


On their way to move men, merchandise—or mountains

For a nation on wheels and on the wing—a production run of forged crankshafts and jet engine compressor wheels for the builders of power-plants for pleasure cars, trucks, earth-moving equipment, and aircraft.

In missile development, too, Wyman-Gordon has proved the value of forging in achieving the highest strength-weight ratios, at elevated temperatures.

With forging experience dating prior to the birth of the internal combustion engine; with the greatest hammer and press capacity in the country; with unexcelled laboratory facilities; Wyman-Gordon is anxious to serve you at the design, engineering and purchasing stages of your developments.



WYMAN-GORDON

FORGINGS

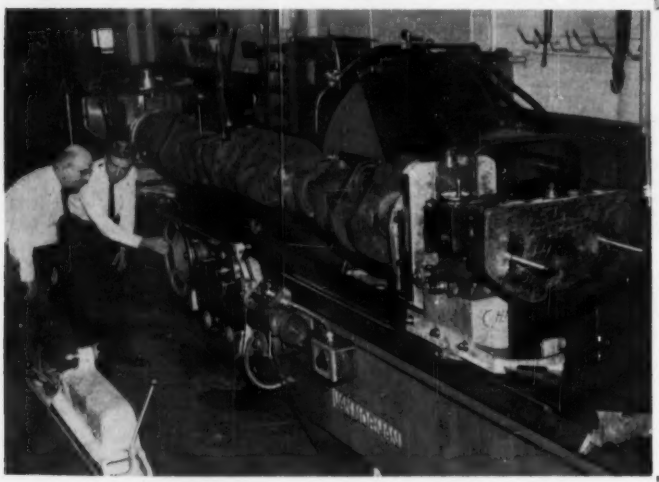
of Aluminum Magnesium Steel Titanium . . . and Beryllium Molybdenum Columbium and other uncommon materials

HARVEY ILLINOIS — WORCESTER MASSACHUSETTS — DETROIT MICHIGAN

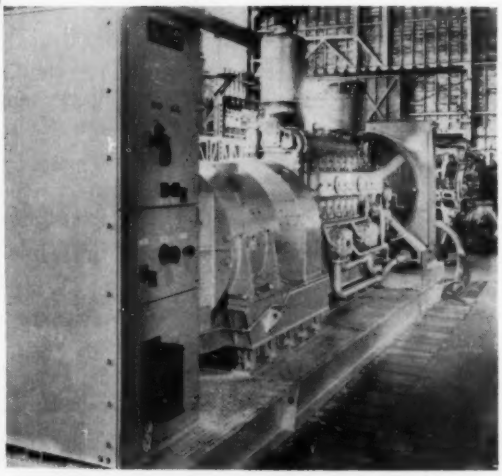
GRAFTON MASSACHUSETTS — FRANKLIN PARK ILLINOIS — LOS ANGELES CALIFORNIA — FORT WORTH TEXAS

diesel power news section

An all diesel story here . . . Two 375-hp Caterpillar D397 engines power the draw works on this Ideco mobile drilling rig, largest trailer-mounted drilling rig in operation. Headed for service in the Libyan desert, major components are mounted on five semi-trailers pulled by diesel trucks. Built for Camdrill International, diesel-powered rig will drill to 10,000 ft, travel 1200 to 1400 miles over desert. Two Cat D339 65-kw Electric Sets, trailer-mounted, provide power for auxiliary equipment and lighting. Two Cat D342 Electric Sets, rated 100 kw provide power for base drilling camp.



This Van Norman machine, one of the largest crankshaft grinders ever produced in New England, is headed for the Pearl Harbor Navy Yard. Six more of these 30-ft long grinders are on order for use in other states in large diesel engine maintenance and repair shops. Robert Clark, right, manager of export sales and Paul W. Leming, Van Norman's president take a last look at the big grinder before it is crated for shipment.



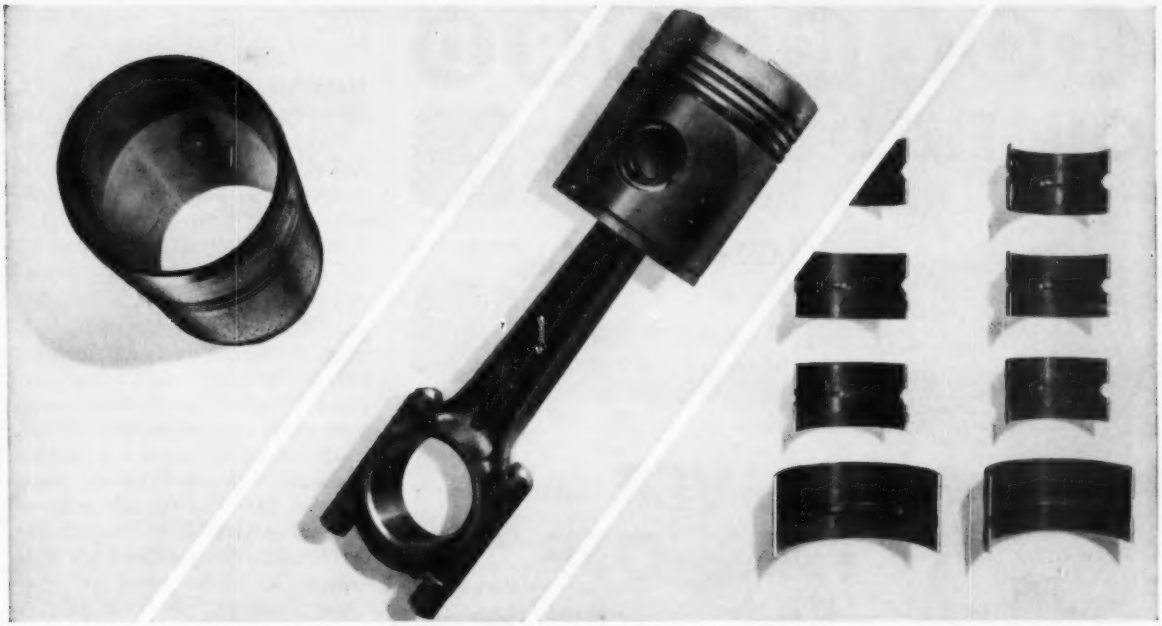
Railroads using diesel engine-generator standbys to insure uninterrupted service . . . this unit, driven by a Cleveland diesel, and rated 300 kw, was installed by the Pennsylvania Railroad to provide emergency power for a drawbridge on the south branch of the Chicago River. Mainline tracks cross here to the line's downtown Chicago depot. Plant was assembled and supplied by A. G. Schoonmaker Co.

NEWS ABOUT PLACES, PEOPLE AND PLANTS FOLLOW ►

The Engineer's Field Report

CASE HISTORY
RPM Delo Oils
LUBRICANT
Progressive Transportation Co,
FIRM Compton, California

RPM DELO holds piston wear to .001" after 201,253 miles of on-and-off highway hauling



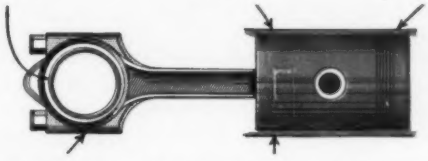
LUBRICATED WITH RPM DELO Oil, these engine parts were pulled from a Cummins HR diesel after 201,253 miles. A portion of this mileage was put on during four months of rugged service spotting loads of heavy pipe in the Arizona desert. When the engine was taken down, after two years of this on- and off-highway hauling, Progressive Transportation Co. found RPM DELO Oil had kept lacquer, gum, sludge, and deposits from forming...rod bearing wear varied between .0005 and .001 inch and pistons showed maximum wear of only .001". No wear at all evident on main bearings. Progressive Transportation uses RPM DELO Oils in all its large fleet of tractors—some of which have traveled well over 200,000 miles without overhaul.

Why RPM DELO Oils prolong engine life

Special compounds stop corrosion

Anti-oxidant resists lacquer formation

Detergent keeps all parts clean



Metal-adhesion qualities keep oil on parts in running or idle engines—inhibitor resists foaming

LUBRICATING OILS RPM DELO

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NEWS SECTION . . .

GM Diesel's Service Craftsman Guild Making Strong Progress In the Field

Just after the establishment of the Guild last February more than 800 applications for membership were received from GM Diesel service personnel. According to Mr. Chester B. Clum, general service manager of the Detroit Diesel Engine Division of GM, the backlog of applications is building up faster than regional service managers can conduct the required examinations. These examinations include over 100 questions on product information, latest factory-approved maintenance and service procedures, plus customer relations. They are not easy exams. Mr. Clum also reported that the high quality of the answers, plus the high percentage of passing grades, was more than gratifying.

The Guild has several announced objectives. The reception of the program would indicate that it is filling an important need in the field. First of all the Guild encourages expert workmanship, recognizes diesel service personnel as technicians. It betters customer relations, through identification of high quality work with the distinctive Guild shoulder patches, and through the pride distributor and dealer personnel take in maintaining Guild standards.

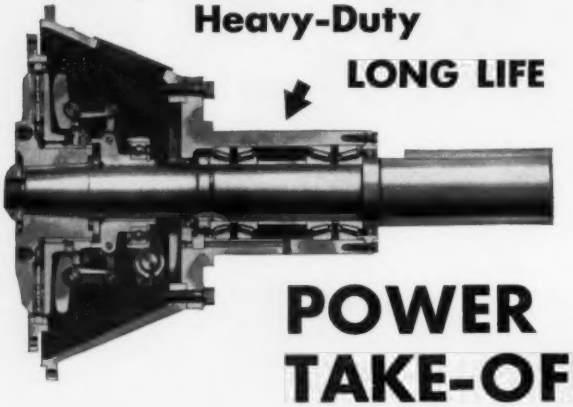
The success of the GM Diesel Guild should encourage the industry to work in this same direction. The diesel service man is on the firing line, often the manufacturer's prime contact with the user. Upgrading this group serves the entire diesel industry.

ROCKFORD

OIL FIELD TYPE

Heavy-Duty

LONG LIFE



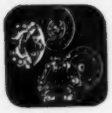
POWER TAKE-OFF

Provides

THESE EXCLUSIVE ADVANTAGES

Designed to meet the needs of Oil Field and other rugged service—this ROCKFORD Extra Heavy-Duty POWER TAKE-OFF

- Eliminates the Pilot Bearing
- Release Bearing sealed for life. Main Bearings run in an oil bath
- Main Bearings are 40,000 hour type
- Handles 5,000 pound Belt Loads
- Out-Board Bearings and Flexible Couplings eliminated
- Furnished with Single or Double Plate, Organic or Morlife® faced Gear tooth Type Clutches



Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

Speed Reducers

SEND FOR THIS HANDY BULLETIN

Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER

1301 Eighteenth Ave., Rockford, Ill., U.S.A.

Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

Henschel Marine Diesels Entering American Market

Henschel-Werke G. m. b. H. of Kassel, West Germany, enters the American market with marine diesels ranging from 52 to 430 hp at 1600 rpm. They offer 4, 6 and 12-cyl models, both naturally-aspirated and turbocharged.

Multiple engine operation is a strong feature of the line, since these are comparably small marine engines. Henschel has a money-saving story to tell about the use of multiple, small high-speed engines in marine applications that will interest many users. A listing of the full range of engines is available on request. Use the Readers Service Card for your copy.

"Solving Some Oil Ash Corrosion Problems"

Burning heavy fuel? If so, you'll want this paper. It makes the problem of corrosive elements in residual fuels a lot clearer. If you're finding corrosion, sludge formation, slag deposits in your engines, Barsad fuel additive may be the answer. This is a technical paper, but it is well written in easy to understand terms. The manufacturer of Barsad obviously knows his subject, and knows it well.

A data sheet is also available showing an engine's time-pressure curve comparison both with Barsad in the fuel and without.

If you're using heavy fuel, or thinking about it, you'll find both these publications worth filling in the Readers Service Card to get.

"Plan Bulldozer"

As the August issue went to press, in which we reported on the Associated General Contractors of America's "Plan Bulldozer," an earthquake hit the state of Montana with devastating force.

Within hours after the disaster, the Montana Chapter of the Association had construction equipment cutting an access road through a landslide to evacuate some 250 people trapped by the quake.

Later in the week, the Army Corps of Engineers called on the local contractors to cut an emergency spillway a mile long through a slide 300 feet high in places. It took a week's work and some $3,000,000 worth of construction equipment.

"Plan Bulldozer," the activation of the tremendous resources of the construction industry in times of emergency, proved its worth the first time out. The industry can be proud of its showing, and of the foresight of the men who made it possible.

Mack Merger Approved

As we reported some months ago, a merger between Mack Trucks, Inc. and the Northeast Capital Corp. has been under consideration. This has now been approved by Mack stockholders. It will give Mack the ability to expand and production should speed up as a result. Almost $12-million cash will become available to Mack for this expansion. One of their first moves will be the purchase of the Brockway facilities which Mack has been leasing for the past three years.

Burmeister & Wain to Supply Brazil with 37 Stationary Power Plants

A healthy order for diesel engine-powered electrification facilities has been given Burmeister & Wain by the Brazilian State of Rio Grande do Sul. In all some 37 engines are involved, 20 of them 300-bhp, 200-kw units and 17 1400-bhp, 950-kw units. Driving generators, this is about 30,000 bhp in all, producing something over 20,000 kw.

First of the engines will be delivered this fall and the balance over a period of a year and a half.

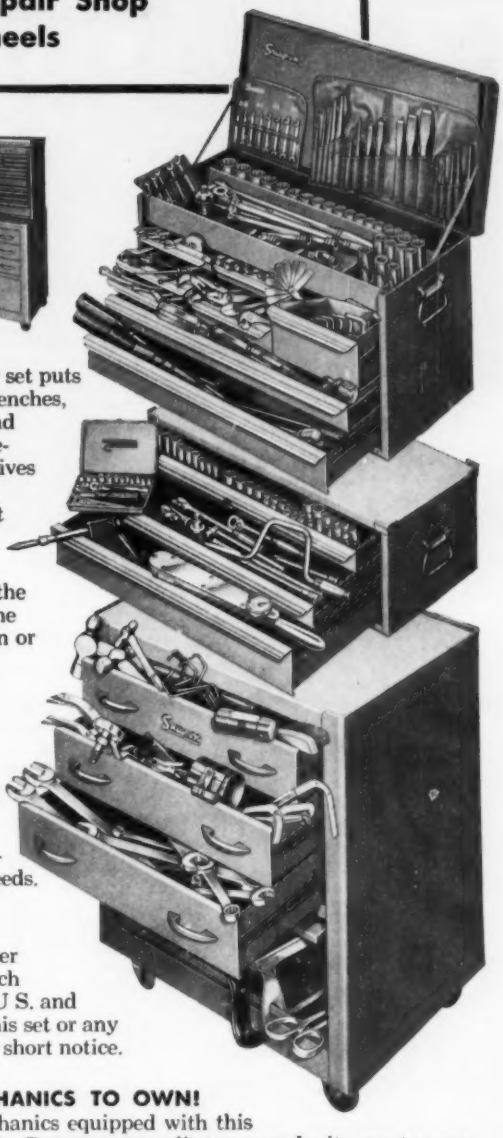
Electrification of a vast area will result in the continued growth of Brazil as an industrial nation.

(*Continued on page* 55)

CUT DOWNTIME TIE-UPS

with this Repair Shop on Wheels

New *Snap-on* 5232 GS-BB set



This big, new *Snap-on*® set puts 232 of the most used wrenches, sockets, screwdrivers and other tools right at a mechanic's finger tips — gives him a real tool layout that gets idle equipment back into action fast.

IT'S PORTABLE! Roll the complete unit around the shop — load any section or all of it on a pickup truck for transport to the job site.

IT'S FLEXIBLE! Get any part of the set or make substitutions either in tools or the drawer combinations to fit your own needs.

IT'S IMMEDIATELY AVAILABLE — wherever you are! With 58 branch offices throughout the U S. and Canada. you can get this set or any other *Snap-on* tools on short notice.

IT'S EASY FOR MECHANICS TO OWN! If you want your mechanics equipped with this set, show them this ad. Convenient credit terms make it easy to own.

Don't let lack of the right tools jam up your repair schedules. This 5232 GS-BB set gives you a range of tools and tool sizes to service both light and heavy equipment. And, top-quality *Snap-on* tools have the feel, fit and long life that run-of-the-mill tools can't begin to match.

Get full details about this set from your Snap-on man.

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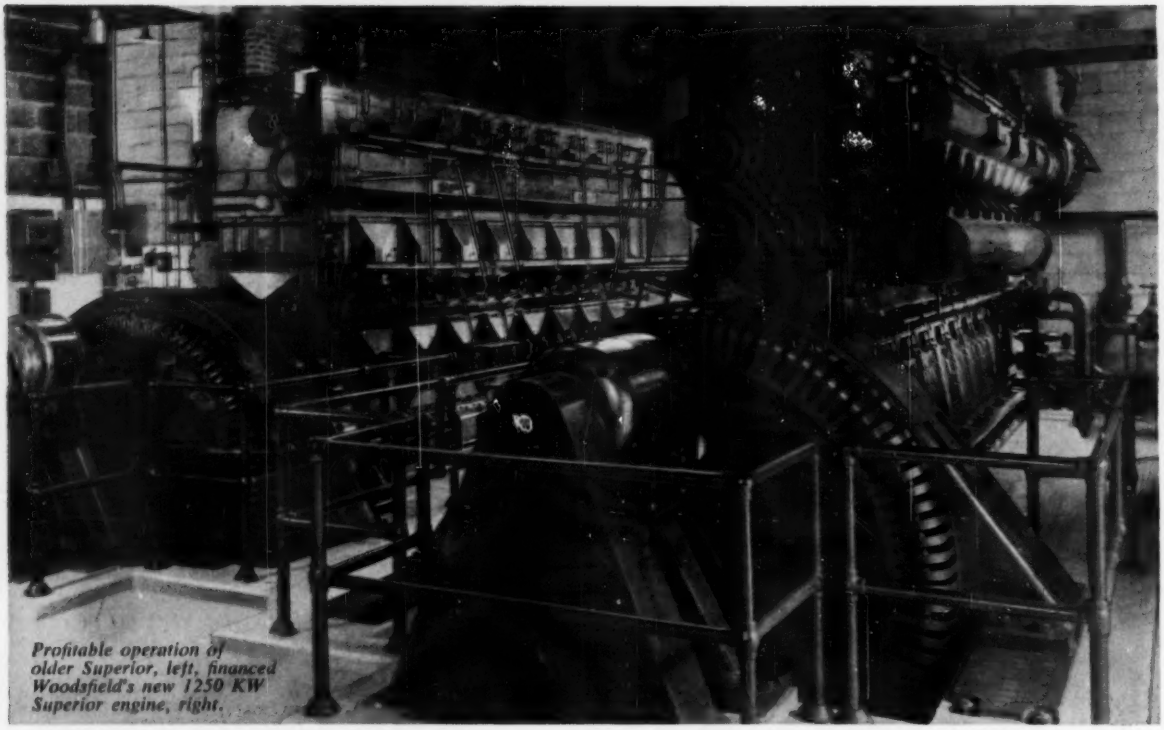


Profitable operation of older Superior, left, financed Woodsfield's new 1250 KW Superior engine, right.

80-GDS-8 runs 44,000 hours without overhaul, cuts fuel cost 50%, pays for second diesel!

Superior engines power Woodsfield's boom!

Olin Mathieson's new aluminum plant on the Ohio River, 18 miles from Woodsfield, caused the town to grow more during 1957-59 than in the previous 25 years combined! Power consumption soared from 2,921,740 KW in 1956 to 4,167,260 KW in 1958, as acres of new worker homes hit the line.

But economy-minded city fathers and maintenance-conscious power plant personnel met the crisis, aided by two Superior engines. The first, an 80-GDS-8 dual-fuel of 600 KW capacity, entered service in 1950. During the next 7 years, it reduced costs per KWH 50% as compared to Woodsfield's 3 older straight diesels. After 44,000 hours operation, it was overhauled in 1958. The only replacements needed were connecting rod bearings. Piston rings were replaced, too, although their .002" wear was well within tolerances.

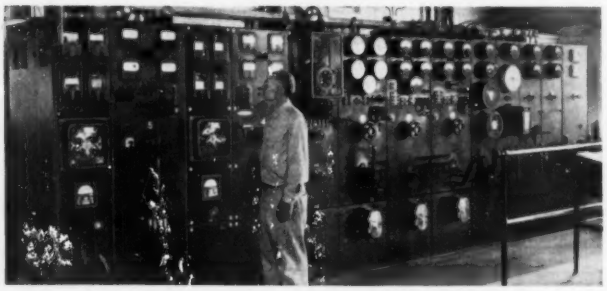
This Superior did more than supply consumers with low-cost electricity. Power profits also financed various municipal improvements, including a second Superior engine-generator! The new 80-GDSX-8 supercharged dual-fuel of 1250 KW capacity commenced operation in early 1958. In addition to maintaining low fuel costs, it operates more than 50,000 horsepower-hours per gallon of lube oil!

For every municipal need, White Superior offers economical diesel, dual-fuel, or gas engines ranging from 190 to 2150 HP, or 150 to 1500 KW!

Superior ENGINES · ATLAS Imperial DIESEL ENGINES · White DIESEL

White Diesel

WHITE DIESEL ENGINE DIVISION
THE WHITE MOTOR COMPANY
Plant and General Offices: Springfield, Ohio



L. W. Marple, plant superintendent, checks controls of town's five power-producing engines.

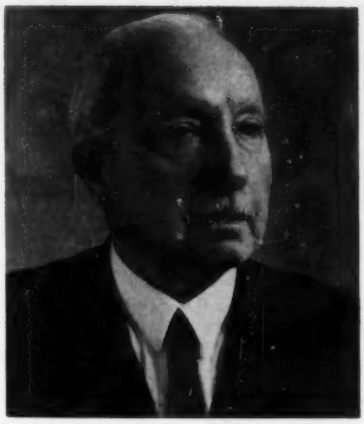
diesel power news section people plants

Curtiss-Wright South Bend Div. Appoints New Distributor

Aldridge-Harbour Equipment Company of Jackson, Mississippi has been appointed a distributor for the complete line of construction machinery manufactured by South Bend Division of Curtiss-Wright. This territory will be southern Mississippi.

Aldridge-Harbour will provide complete sales, parts, shop and field service facilities for Curtiss-Wright.

C-W's South Bend Division has also announced the appointment of Edward C. Warsaw as District Sales Manager in the territory which includes Minnesota, Iowa, Wisconsin, Illinois, Indiana and Eastern Missouri. Mr. Warsaw has a broad background in the sales and service divisions of the construction machinery business.



Dr. Alfred J. Buchi Dies

Only three months after celebrating his 80th birthday, Dr. Alfred J. Buchi passed away following coronary thrombosis. The industry he served for so many years, and to which he contributed so much, has lost a respected friend and a keen mind.

Dr. Buchi, honored by Technical Societies throughout the world, was considered the "father of turbocharging." In a sense he was fortunate in that during his lifetime he was able to see his engineering concepts mature and change an entire industry. Right up to his death he was active, contributing important ideas.

Those turbochargers in use and those yet to be built will serve as a continuing remembrance and a fitting memorial to an inventive and analytical mind—and a fine man.

Garrett Wins Certificate of Merit From National Safety Council

Garrett Corporation's AiResearch Industrial Division has been awarded a certificate of merit for 522,001 consecutive man-hours worked without a disabling injury. The division is a leading firm in the development and production of turbochargers for diesel engines.

(*Continued on page 56*)

START ENGINES EVERY DAY WITH SPRAY...

STARTING FLUID FOR DIESEL & GASOLINE ENGINES

Get more starts, quicker starts, at lower cost with SPRAY STARTING FLUID. Both the fluid and propellent burn . . . there's no waste! Each pressurized can contains enough fluid for many starts . . . starts that will sustain combustion until a smooth running engine can take over. Our greater supply of "vapor pressure" at all temperatures, atomized at a high initial rate, shortens cranking and warm up time, reduces dilution, prevents electrical and starting system wear, saves wasted man hours and equipment down-time. SPRAY is atomized for safe application and quantity control . . . use only as much as the engine requires. Field-proven SPRAY STARTING FLUID will start the toughest engine down to 65° below zero . . . but for year 'round economy start engines every day with SPRAY! Sold through automotive jobbers everywhere.

Ask about INSTNSTART closed system starting.

Insist on the can with the "balky donkey" trademark.

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MODEL K-120

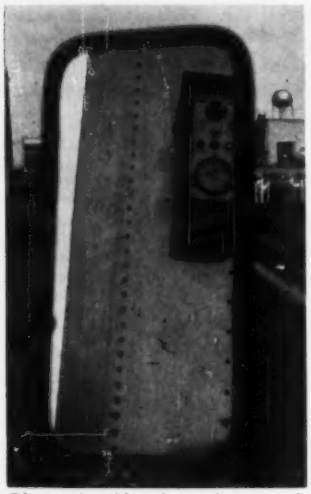
universal peak firing and compression pressure indicator

The Model K-120 is the only maximum pressure indicator that can be used as a compression tester on small, high-speed engines and as a firing pressure indicator on engines having indicator valves. Patented Kiene diaphragm type check valve of stainless steel has no springs or piston, no complicated adjustments, temperature corrections or pressure loss. Bleeder valve permits release of indicator pressure for repeat readings. This instrument gives true pressure readings with an uncompensated gage.

Adaptors for most models U.S.A. engines. Others made to order at reasonable prices.

KIENE DIESEL ACCESSORIES, INC.

10352 PACIFIC AVE., FRANKLIN PARK, ILLINOIS



Glance in side view mirror monitors refrigeration operations.

A LOOK AT TODAY'S TRUCK REFRIGERATION

What's happening in refrigerated truck transportation—and particularly in dieselized refrigeration? What's involved from the viewpoint of three areas—user requirements, sales and service, and finally a product to meet these needs.

We got a story at Illinois Auto Electric Company's new Forest View (Chicago) Division. For many years, IAE has been in the business of truck refrigeration sales and service, truck equipping and in similar allied lines. Expansion of these lines, plus taking on the Hercules Motor Company distributorship, meant moving these activities to a new facility located near Midway Airport, right in the heart of the truck terminal area.

IAE is a factory warehouse distributor for Thermo King Corporation truck refrigeration units, providing sales, installation and service. Beng in close contact with both factory and user, IAE vice-president Henry Sirotek and division manager John Souders could give a rounded story. Here it is as they see it.

EVERYTHING from plasma to frozen foods is moving by refrigerated truck today—and more of it. Not only is a greater total tonnage moving but more is being moved per load. Reefer trailers are getting as long as the law allows and are designed for higher cubage. Insulation up to 8-in. thick is used in many and to pull the box down to some of the low temperatures required, refrigeration units must have higher capacity.

"Need for more capacity (and that means more power), greater dependability and lower overall operating costs are making truckers look more and more at diesels in these units. We'll be seeing more of them as more are available and performance data piles up. Of course, it will be a case of need . . ."

Breaking in on Henry Sirotek's comments, we asked for a general rundown of truckers' "needs." Here are some of the comments.

Refrigeration requirements vary all over the lot . . .

What are you going to haul In what climate and at what time of year? All of these are major factors affecting the type of refrigeration unit, the trailer in which it is mounted and eventually its servicing.

As Mr. Souders pointed out, even your wife's refrigeration requirements vary. There is a 40°F to 45°F general compartment, special temperature-controlled niches for leafy vegetables, meats and butter. Then, you need a freezer for the frozen foods. It's just the same with truck refrigeration.

Added touches include the fact that you are rolling your refrigerator through climates that range from desert heat to mountain snows and all the variations due to seasons. Normally, we think in terms of cooling but under some conditions, heating can be involved. In zero weather, a cargo that cannot safely be frozen requires heating of the box. This introduces units of the cooling-heating reverse-cycle type.

Type and capacity of the unit must be matched with the trailer, its size and degree of insulation, to get the best results for a particular job. If you're carrying pump-

Against a background of truck equipping and conversion work, Henry Sirotek discusses a job with a customer.

"Bring her in at 10 am," said John Souders, busy scheduling repair work over a phone that never seems to be still.

(SPECIAL REPORT BY DIESEL POWER)

kins or squash, 60° to 65°F is okay and you can get this with 3 to 4-in. insulation and a low-capacity unit. Start hauling frozen fruits and vegetables and your spread is −5°F to zero.

This can mean a trailer, well-sealed, with up to 8-in. insulation and a 7½ to 10-ton capacity refrigeration unit. If several commodities are to be carried at the same time, some provision for "zone" cooling is needed. This all adds up to a pretty complex package, particularly when multi-purpose use is planned.

Contract carriers can sometimes plan for a narrow spread of requirements based on the commodities normally hauled. Common carriers, wanting to be ready for any type of refrigerated load, must have maximum range.

All carriers have certain common requirements—reliability of the refrigerating system, long service life and minimum operating costs. All of these are arguments for diesels except where cooling requirements are very nominal.

Service availability is another important factor. Any piece of mechanical equipment can sometimes fail, downtime is expensive and there is the added factor of possible loss of a valuable cargo. If something should happen, truckers want it taken of care of fast.

. . . *the right unit, backed by good, fast service builds sales*

"We build sales on service. It's the 'plus' that our sales force has to sell. So if we talk service, we are talking sales. A good example of a direct effect is the waiting room we set up for our customers. There are coffee, smokes and a telephone. While drivers are waiting for repairs they get to talking things over and comparing. Some are owner-drivers. It builds good will and sales.

"Our service includes everything from installation and complete overhaul to minor repairs and adjustment . . ."

There are the comments of John Souders as we started looking the place over. In the front of the shop, several refrigeration units were undergoing repairs. Engines, compressors and evaporators—all were getting repairs or overhaul in accordance with their needs. Each was mounted on a special movable work stand, making it convenient for the men. Where engines were removed, most were small enough for bench overhaul.

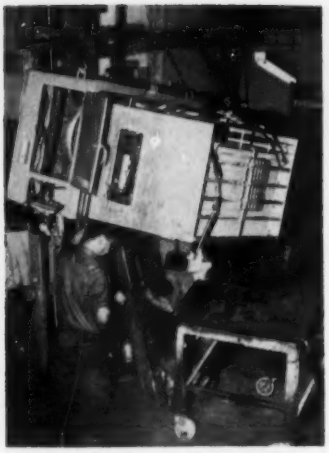
Behind this area are five bays and at the time, each held a trailer. Men were all over the rigs, working with a sense of urgency. John Souders explained that this was mostly emergency work. Some trailers were even loaded and whatever adjustments and repairs were needed had to be done fast. Drivers were waiting for some and others, when finished, were hauled to the yard for pickup.

Before noon the bays were clear and the trailers on their way. The versatile technicians then reverted to the shop's base load—unit rebuilding and installation. Much of the installation and detailed repair was going on in the yard, leaving the bays open for emergency work. Completing the concept of fast service, a specially-equipped truck is on standby for road calls.

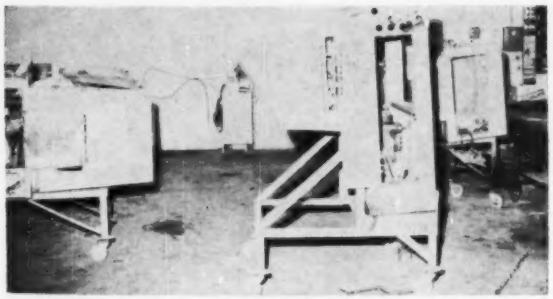
Asked if this was the usual pattern, Henry Sirotek said that it was except for seasonal variations. The going is easy for refrigeration units at temperatures between 40°F and 70°F. Above and below these temperatures they work hard and the volume of repair and adjustment builds up.

Didn't this reflect on the reliability of the units? Henry's answer made real sense. First, this volume of work represented only a small percentage of the refrigerated trailers in the area. Seconds, trip repairs on tractor-trailer rigs are normal and are done by the trucker to insure reliability on the road. The same applies to refrigeration units but since this is specialized work, they send it to a specialist.

John Souders commented that in the past few years truck refrigeration has really grown up. Today's units, given reasonable care, are as dependable and trouble-free as the rest of the mechanical components on a rig. Truckers expect and get long dependable service.



Fork lift solves handling of refrigeration units. Note blocking of suspended unit — urgency never out-ranks safety.



Special stands for various refrigeration units provide mobility and accessibility. Make it easy for the men and they'll do a better job.

. . . *and speaking of tough, dependable units*

A P.I.E. trailer stood out in the parking area. Its diesel-powered refrigeration unit was running to chill the interior down before it was loaded. This was one of over 100 delivered to P.I.E. The "Imperial" model UW-D is the top performer in the Thermo King line.

In addition to sales and service of these units, IAE makes pre-delivery checks of original equipment installations for Thermo King. This was a 40-ft box built by Fruehauf Trailer Company for multiple use. It carries 8-in fiberglass insulation. The evaporator, with its fans, was mounted on the inside of the front wall.

The engine-compressor-condenser unit is suspended under the center of the trailer and connects to the evaporator by refrigerant piping and electrical control wiring. The diesel is the Mercedes-Benz Model OM 636 4-cyl engine directly coupled to a 4-cyl, vee-type compressor. A belt-driven generator supplies electrical power, including that for evaporator and condenser fans.

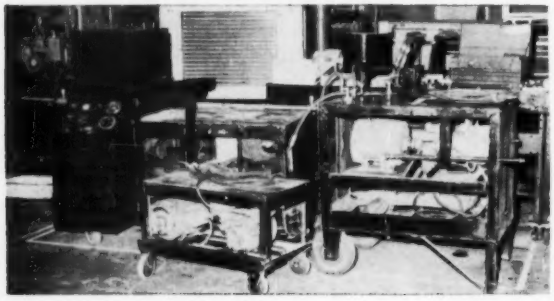
Thermo King contracted for 1500 of these engines with the Utica Division of Curtiss-Wright. It is the same basic engine as in the Mercedes-Benz 180D passenger car and in this application as well as in small coaches and trucks has proven its ruggedness and dependability. One modification to the Robert Bosch injection equipment is use of a mechanical governor set for constant speed operation at two selected speeds—1400 and 2400 rpm. For this service and at the higher speed it is rated 36 hp.

Use of this small diesel (piston displacement is only 107.8 in.) made possible a compact condenser unit "package." Its dimensions are 59-in. length, 35-in. width and 28-in. height. In this are the engine, compressor, a 220-v, 3-phase a-c generator, condenser and receiver. Of course, all accessories for engine operation, including protective devices, are included.

Operation was described as "constant-running, modulated speed, reverse cycle." Taking this apart it means that once the engine is started, it runs constantly until deliberately shut down. Engine speed is "modulated" to run at the high or low rpm given in accordance with the cooling or heating requirement at the time. The reverse cyle permits the unit to either cool or heat as needed at either of the two operating speeds.

Basically, the engine drives the compressor to compress the refrigerant. In being compressed, it is also heated. This heat is removed in the condenser unit. Cooled, compressed refrigerant is run to the evaporator. It is now allowed to expand through an orifice. To do so, it requires heat and extracts it from its surroundings. In truck evaporators, it takes it from the air that the evaporator fans circulate around the box.

All shop built, mobile test equipment permits rapid testing of both mechanical and electrical testing of unit components.



With morning "hot" jobs out, trailer bays are kept clear for urgent jobs. Test equipment, parts supply are readily accessible.

COMPARE

TORQUE AIR CONSUMPTION PRICE

Make	Advertised Ft. Pounds Torque 10 Sec. At 90 PSI	Actual Ft. Pounds Torque 10 Sec. At 90 PSI	Advertised Ft. Pounds Torque 10 Sec. At 120 Lbs.	Actual Ft. Pounds Torque At 120 Lbs.	Advertised Air Consumption	Price 1959
Sioux #313	60	73	80	98	2½	$119.00
"K"	None	72	None	95	2½	144.50
Sioux #314	75	87.5	95	102	2¾	123.00
Sioux #315	130	145	185	185	3½	127.50
"A"	None	139	None	181	4	139.50
Sioux #316	195	195	235	235	3½	138.50
Sioux #317	195	195	235	235	3⅜	138.50
"B"	None	127	None	173	4	170.00
Sioux #318	250	265	300	320	3¾	195.00
Sioux #320	750	770	900	1050	7½	325.00
"L"	None	700	None	1000	8	355.00
Sioux #322	1000	1050	1200	1250	8	367.50

Air Impact Wrench!

ALBERTSON & CO., INC.

SIOUX CITY, IOWA, U.S.A.

AIR IMPACT WRENCHES • AIR SCREWDRIVERS • ELECTRIC IMPACT WRENCHES • ELECTRIC SCREWDRIVERS • GRINDERS • SANDERS • POLISHERS • FLEXIBLE SHAFTS • PORTABLE SAWS • VALVE GRINDING MACHINES • ABRASIVE DISCS

Fully equipped truck stands by for road calls. Work platform over truck facilitates servicing of high-mounted units. At right, special scaffolding serves similar purpose in the yards.

Now, the reverse cycle. In this case, the hot, compressed refrigerant is pumped to the evaporator. In this case the circulated air picks up the heat from the refrigerant and adds it to that of the box. As is the case when cooling, heating can be at the fast or slow rate as required.

Glow plugs, as used in the automotive version, are used to insure engine starting at all temperatures. A control panel at the unit has the glow plug and starter controls. Once started, operation is automatic under thermostatic control. In addition to keeping the box at the desired temperature the controls also provide for automatic defrosting of the evaporator unit. It is also possible to defrost manually.

Instruments on the panel monitor engine operation including totaling operating hours. High cooling water temperature or low lube oil pressure will shut the unit down and lights indicate the particular fault.

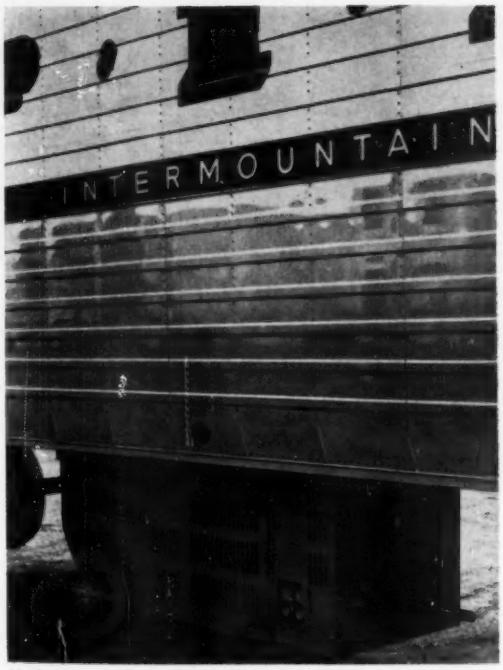
Once the unit is started and the box pulled down to the desired temperature, it is loaded and the driver is ready to go. A 30-gal fuel tank, mounted under the trailer, supplies fuel for long-term continuous operation. Even under the unlikely condition of continuous full-load operation this amount of fuel provides for better than 12-hr operation.

On the road the driver can monitor the functioning of the system by the simple method of looking in his side-view mirror. Instruments and lights mounted in a panel on the trailer-front tell box temperature and operating condition.

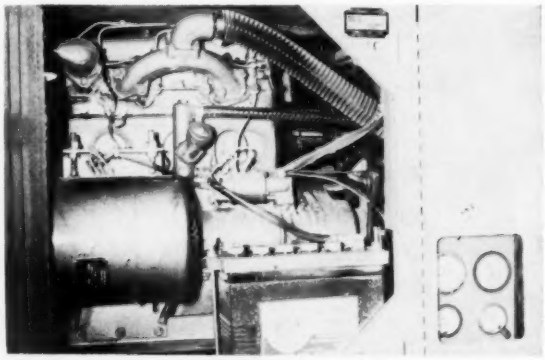
. . . *today's needs — diesels*

When it comes to truck refrigeration, truckers want reliability, long operating life, low operating costs and fast service availability. Where low temperatures are involved as with frozen foods, either where this is the principal load hauled or where a trailer must have multi-purpose capability, high-capacity units are needed. They must have operational flexibility, including reverse-cycle operation.

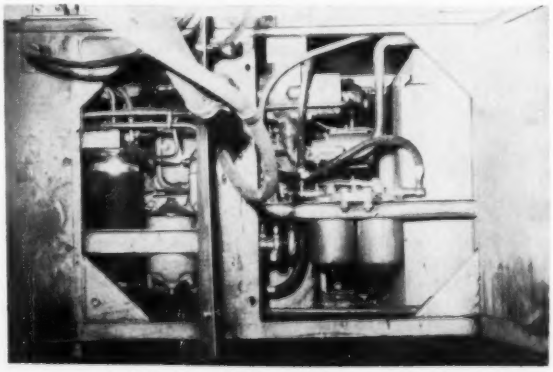
All of these requirements point to diesel-powered units of the type discussed. Fast service availability is provided by specialized organizations such as IAE. With the availability of diesel engines small enough and light enough for this service, plus sales and service programs to insure that these units will be properly applied and maintained, it looks like an expanding market for diesels in heavy-duty truck refrigeration.



Under-mounted engine-compressor-condenser combination on PIE trailer. Gravel guard at left protects condenser.



Both sides of unit are accessible through wide doors. Above, on intake manifold side, often serviced components, oil filler, generator and battery are readily at hand. Below, same is true of other side of unit. Fuel and lube filters are mounted in front of fuel injection pump and governor on inboard side of unit.



Start an EMSA Chapter In Your Area

Such Associations stimulate the flow of information . . . break down barriers to effective communication . . . provide a forum for interchange of ideas . . . give purpose and direction to legitimate objectives . . . Present members of the Equipment Maintenance Supervisors Association are individually and collectively realizing solid benefits. Here's how you can participate by starting an EMSA Chapter.

EMSA secretary James H. Miller and EMSA president Sam Weatherbie discuss membership certificate design.

THE men who started EMSA are prettty sharp. They knew that their motivation to organize a group locally existed and was equally valid all over the country. It was just that they had done something about it and that where they led, others would want to follow.

EMSA's By-Laws show this. Let's take a look at some of the provisions for setting up Chapters to see how it all works.

How By-Laws provide for Chapters . . .

You'll first be interested in EMSA's objectives. Let's take them right from Article I.

"To promote the growth of the construction industry . . . by assisting one another with their mechanical and/or manpower problems: to reform abuses in the industry: to collect and disseminate information concerning matters of interest so that those in the industry may cooperate with one another to the fullest possible extent, within legal limits, for the general well-being of all members of the Association."

Sound like something you want to be part of? We'll bet.

Three classes of membership are listed—"Regular", "Associate", "Honorary" and "Charter". Individuals have a sort of dual membership—first, as a member of the Association and, second, as part of a member Chapter or of the Headquarters group.

This is not unlike a citizen's -"Federal" and "State" relationship, in fact, other provisions strengthen the analogy. Chapters have autonomy for programming and general operation providing they conform with the stated objectives and policies of the parent body. They elect their own officers to administer the Chapter.

The existing "code of law" for the governing of the whole Association is the By-Laws.

Want to start a Chapter?

Eventual growth of EMSA is going to depend on the interest and activity of its Chapters. The parent group was started as the result of a localized need. The same exists in your area and it will require only a little push to get a Chapter started. You be the "self-starter".

Talk it up with other equipment maintenance supervisors in your area. They're probably just as aware of the benefits to be gained as you are. They know that to get where they are, they have had to scratch for every bit of knowledge and have wished hundreds of times that they had somewhere they could turn for ideas and answers to get them off a bad hook.

Who can belong? "Any person engaged in supervising maintenance and repair of equipment shall be eligible for election to membership as regular member". Others interested in this field but not meeting this qualification may be elected as associate members. This means equipment distributors and suppliers to the industry who can contribute so much to the success of such an Association, both in technical information and ideas as well as help in sharing the work load.

Also, EMSA will help you get a Chapter started. What more do you want? It's being laid right in your lap. All you have to do is to stir up sufficient local interest.

Broadening EMSA . . .

Present wording of the By-Laws restricts membership to equipment maintenance supervisors in the construction industry. Yet EMSA President Weatherbie in a statement to Diesel Power, printed in July, 1959, said in part:

"Maintenance supervisors, master mechanics, call them what you will, are a specialized group whether they be in trucking, logging or mining industries.

One common interest is the diesel engine. Each can learn something from the other. We started EMSA with maintenance supervisors of construction equipment in mind. With interest spreading to other fields, perhaps the "E" will stand for all types of equipment, the common bond being that specialized individual—the maintenance supervisor."

One thing is needed to make EMSA a common meeting ground for all maintenance supervisors, all learning from each other. This would be real expressions of interest from other groups.

EMSA is just beginning to grow. The solid benefits that a few energetic and far-sighted men worked for are being realized in Los Angeles, San Diego and San Francisco. Working with this nucleus, you can get the same benefits in your area while working toward a bigger, stronger and more effective Association. Why not grow with it?

Diesel Power, working with and through EMSA, will do everything in its power to help you get a Chapter started. Tell us what you want and what we can do.

whatever the
power production application . . .
you can depend on
CUNO
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"The more complete the filtration, the more efficient the production of power." Cuno filters remove damaging contaminates and reduce costly stoppages.

To meet the specific requirements of *your* power production application, Cuno provides effective, engineered filtration with . . . Auto-Klean Self-Cleaning Edge-Type, Flo-Klean Automatic Self-Cleaning Wire Wound, Micro-Klean Disposable Depth Cartridge . . . available in a variety of housings.

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In Canada write: Peacock Bros., Ltd., P.O. Box 1040, Montreal 3, P.Q.

"Every piece of diesel equipment we operate has a code number, a file card—and that is our way of knowing how much down-time that equipment has had, what parts have been replaced and at what time during its life.

"It is the responsibility—just one of the responsibilities, —of men like Dale Oman, to keep these file maintenance cards perfectly, accurately, so that S.J. Groves & Son can refer to them and to the 'diesel man' when it comes time to purchase more equipment."

Elton Kenyon, Job Superintendent,
S. J. Groves & Sons Co.,
Construction-Engineers,
Minneapolis, Minnesota

Dale Oman in his present headquarters, abondoned airfield office next to hanger he adapted to equipment maintenance work.

Today's Diesel Man

S. J. Groves chief executive, Frank Groves, confers with Elton Kenyon, project superintendent beside company plane.

DALE N. Oman drew his first pay check driving dump trucks during summer vacations in high school. Later he operated an RD-8 wagon and an Athey wagon for Oliver Mining Co., at Hibbing, Minn., "scramming" good ore out of little pockets on top of taconite. "In those days a company depended upon the truck driver to keep his equipment in good repair," Oman says. Today, as a Groves equipment superintendent (one of five in a wide-flung organization), Oman oversees diesel equipment worth more than a million dollars.

For the record, Groves & Sons, about a year ago, was one of the "top ten" heavy construction firms in the nation, with a volume of $75,662,692 in contracts on far-reaching projects. Oman, at this writing, is equipment superintendent on several such jobs. We talked with him at the Fairview, Pa., field office of Groves' 13-odd-miles of Erie County Thruway construction. This Groves contract, or two contracts on two Thruway sections, totals about $10,000,000.

"Diesel equipment? Well, working for Uncle Sam in the Merchant Marine I went from Liberty ships with reciprocating steam engines to an Army transport, as Junior 3rd Engineer. She had a big direct-drive diesel, and diesel-generator sets," said Oman.

Oman lists work for a Cat dealer in Minneapolis, Wm. Ziegler Co., covering everything from track and roller work to tearing down diesel engines for repair, following the war. Then he worked for Garrison Bldrs., of Riverdale, N. D., on the Garrison Dam, sandwiched in some Allis-Chalmers experience with Borchert-Ingersoll, a dealer, and went with Peter Kewit & Morrison-Knudsen Co. for two years that saw completion of the Garrison Dam.

"Those years saw me doing everything from field preventive maintenance and field mechanic work to engine rebuilding," Oman relates. "Finally, I hooked up with my present company, S. J. Groves, in June, '51, again back on the iron range in Minnesota, where they were handling construction previous to the building of a Taconite plant. I got into Cummins, Jimmy and Cat engine rebuilding work—and did my first 500-hp engine job, a Cummins, for a Lima shovel."

You see Today's Diesel Man, exemplified in Oman, gaining vast, concrete experience leading up to a tremendously responsible job—equipment superintendent, or as he puts it, "You might as well say diesel equipment superintendent, because diesel power is the 'way of life' for construction equipment of all kinds, and we have just that—all kinds."

Ingenuity is demanded of Oman, too, in his job. He

Groves paving train at work on section of Erie County Thruway.

Engine comes out of Cat scraper on Oman's craneway.

Groves diesel equipment now gets the works in airport hangers.

was told to find ". . . an old barn," in which, in the fall of '58, he could begin a major overhauling program on a diesel fleet of considerable size. At that time, he was running the Ann Arbor shop for Groves, although he had jumped all over the country on diesel equipment work, from Michigan to New Jersey and back, filling in as master mechanic or equipment manager.

"I spotted this abandoned Fairview airport. The management had moved to the greater Erie airport down the road (Erie, Pa., about 13 miles from Fairview), leaving several hangars and an office building," Oman reported. "We built our own craneway in one hangar, for lifting heavy engines and the like, saved several thousand dollars as against buying or having a craneway put in. In fact, Groves makes a policy of fabricating much of its own diesel or shop repair facilities, stands and the like."

This conversion of an airport to a field shop was for general overhauling of about 40 pieces of diesel-powered, rubber-tired equipment, some 20 pieces of track-mounted machines, three large cranes and various automotive and miscellaneous equipment. Close to 2,000 horsepower in diesel engines was involved, most of this for Erie County Thruway work.

Although diesel engines were involved, this major shop work included everything ". . . from the push block to the fan and radiator" on a piece of equipment, Oman points out. This particular instance provides a good example of PM in the Groves organization, he continued. And it illustrates the personal responsibility he carries in his overall equipment supervision.

"Both shop and field preventive maintenance come under my direction, as well as shop setups in this and other localities," said Oman. "The key to my thinking about diesel equipment, and the availability of such equipment, is in our preventive maintenance file, as project superintendent Elton Kenyon has said. My master mechanic, or his best mechanic, pulls the 100-hour PM card on every piece of equipment, keeps after it . . .

"This checking can be done in the field, even during greasing periods, only taking ten minutes or so, adjustments or repairs, or replacements of parts, is referred to one of the two shifts of our repair shop, depending upon the job to be done."

How does a diesel man like Oman keep up with current trends in diesel equipment and its maintenance, and how does he influence buying in his job? He belongs to contractors' organizations in the several states in which he works—Michigan, Pennsylvania and Ohio, currently. He attends trade and association conventions and shows. He talks over with his maintenance men and his superiors the "whys" and "hows" of practically every piece of diesel equipment in regular use.

"Standardization is a big thing with us," Oman states. "You can list so many things under that, of course, and all diesel men know what I mean. I like to read trade publications, too, and find them very interesting and arresting—they make you think, just as DIESEL POWER does.

"To get back to parts: buying price can be foolhardy. Sometimes it works both ways. Usually you get what you pay for. But sometimes we've been surprised. We've tried, purposely, to compare higher-priced wire rope with less expensive wire rope. We found dependability and wearing qualities equal or favoring the second rope."

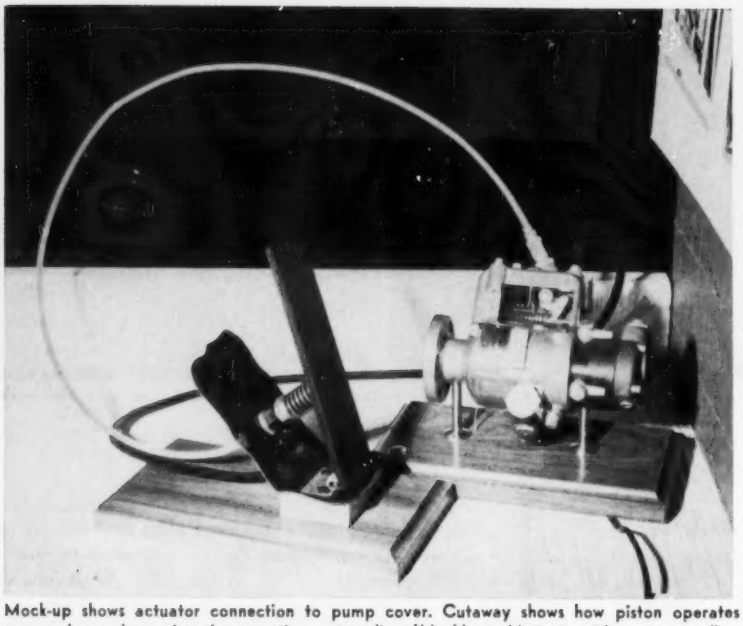
What buying does he do, or influence?

Oman will buy, or ask for the purchase of engines, accessories and engine parts at his discretion; engines to repower older equipment; equipment parts of all kinds. He'll buy or influence the buying of driveline components, but not necessarily the same as original equipment, he reports. Torque convertors? "We rebuild them," he says, "or charge them up to job expense or overhead."

Oman either decides, or has a lot to say, about the purchase of fuels, lubricants, filters, test equipment (such as dynamometers, analyzers, etc.) hand tools, power tools of specific type, such as impact wrenches, batteries, tires and so on, through wire rope and related items. He must be, literally a "student" of diesel power and equipment.

"There's always more to learn in this business of being a diesel man," Oman smiles. "Its a fast growing field and it keeps you hopping."

Today's diesel man controls more equipment, gets more work out of it than ever before. He speaks for his industry, another diesel-powered industry.



Mock-up shows actuator connection to pump cover. Cutaway shows how piston operates cam and speeder spring. In operation, return line (black) would tie in with pump overflow and return to fuel tank.

Pedal-to-Pump Linkage Goes Hydraulic

Mechanical linkages from accelerator pedal to RoosaMaster fuel injection pumps are eliminated with new hydraulic control combining positive, precise control with ease of installation.

ANY time you install an engine, throttle linkages are a problem. This is particularly true in vehicular applications where engines are flexibly mounted and space usually limited. No matter where you want to run the linkage, something is always in the way. Then there is always the matter of getting the proper relative motion at each end.

Hartford Machine Screw has come up with a neat solution to this whole frustrating business for applications where their fuel injection pump is used. All that connects the accelerator pedal and the pump is a flexible tube. It can be routed to avoid all the inevitable obstructions and being flexible, accommodates all engine movement.

How it works . . .

Two major components are connected by hydraulic tubing. The first is a servo piston pump or actuator located under the accelerator pedal. It has its own return spring for the actuator piston. The actuator has a two stage piston arrangement which permits considerable pedal movement for small engine speed changes, so helpful when moving equipment small distances. This gives a very satisfactory control over the vehicle at low engine speeds. As the pedal is pressed downward for full power, the second stage of the actuator is employed and here, due to change in effective area of the piston, you obtain considerable movement of the receiver piston for each increment of pedal position change.

This pump, through a solid column of fuel in the hydraulic line, actuates a piston in the special injection pump cover. Cam action positions the governor's speeder spring in proportion to pedal movement.

Mechanics of getting this "solid" actuating column, a basic problem of hydraulic controls, has been simply worked out. The injection pump is fuel-lubricated and a continuous flow of fuel, supplied at nominal pressure from the fuel transfer pump, is available in the pump housing.

When the actuating piston in the injection pump housing cover is in idle position, a porting system permits fuel to enter the hydraulic actuating line. At the pump on the floorboard, a spill line is connected to the recirculating or vent line from the injection pump back to the fuel tank. Thus, at idle position there is continual flow from the pump housing, through the control system, to the fuel return line.

At any pedal position above idle, the porting is closed and the hydraulic column, now solid, is locked. Flow recurs on every return to idle position, insuring maintenance of a solid, air-free actuating column.

The system is fail-safe, being arranged so that if the line should break or anything else happen to bleed off the actuating oil, the injection pump returns to idle under governor spring pressure. A ball-check in the return line prevents any reverse flow of fuel.

Installation is simple . . .

The control pump is installed on the floorboard under the accelerator pedal. Holes are drilled for two lines—the actuating line and return line. The actuating line is routed conveniently and clamped for support. The return line is connected to the vent line from the injection pump that leads back to the fuel tank.

The actuating line connects to a special cover plate on the injection pump housing. This is designed so that when installed, the actuating cam engages the governor speeder spring. Both idle and high-speed adjustments are made at the injection pump. This is done by locating the actuating piston assembly (threaded, with lock nuts) in relationship to the cam.

After installation is complete, the governor is in idle position. With the engine running, a little pumping of the accelerator pedal permits the lines to bleed out air and fill with fuel. From then on, filling is automatic and you're all set to go.

Now you can have DIESEL ECONOMY in light and medium-weight vehicles at low initial cost

HERCULES NEW DIESEL LINE is the first to make diesel re-powering of lighter vehicles both practical and economical

NEW HERCULES DIESELS FOR

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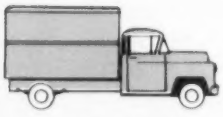
CABS

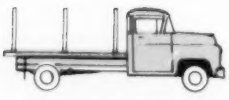
PICK-UPS

MULTI-STOPS

3,000-6,000 GVW



LIGHT VANS

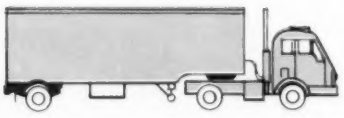


LIGHT STAKES

ROUTE VANS

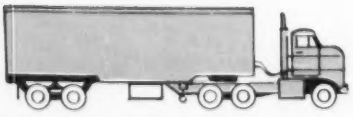
6,000-12,000 GVW

MEDIUM VANS

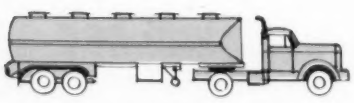


LIGHT TRACTOR-TRAILERS

12,000-24,000 GVW
(to 36,000 GCW)



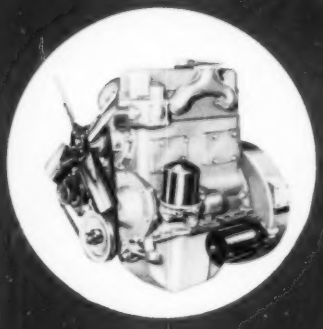
TRACTOR-TRAILERS

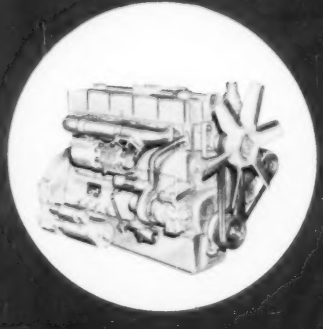


TANKERS

22,000-38,000 GVW
(to 55,000 GCW)

REPOWERING are the first reach of every operator!





MOST WEARING PARTS ARE INTERCHANGEABLE BETWEEN ALL ENGINES

HERCULES ECONOMICAL THREES

DD-149-H DD-169-H

- Compact, balanced design packs 60 max. hp in 550 lb package
- Full, 2,800 rpm automotive design and construction
- First economical 4-cycle diesel truck engine ever offered in its size
- Terrific 3-cylinder fuel economy for in-town service

HERCULES FUEL-MISER FOURS

DD-198-H DD-226-H

- 75 and 80 max. hp engines designed to match your vehicle's needs
- Outperforms many 6-cylinder diesels
- Compact . . . lower weight/brake hp than other comparable diesel engines
- Ideal for shuttle work . . . low fuel consumption with economical 4-cycle power

HERCULES POWER-PACKED SIXES

D-298-H D-298-HT

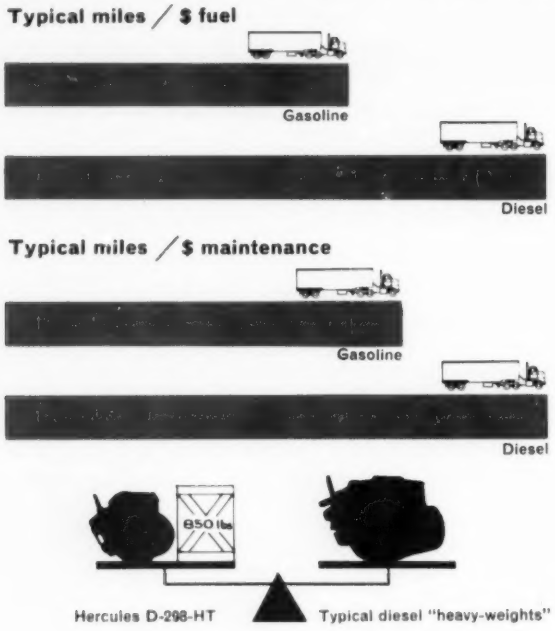
- 115 (naturally aspirated) and 175 (turbo-charged) max. hp at 3,000 rpm
- Lowest weight/hp of any diesels in their class—turbo-charged model weighs no more than many comparable gasoline engines
- 4-cycle fuel economy and simplicity
- Compact high-speed design permits repowering most gasoline engine-driven vehicles without changes in gear trains

D-426-H D-426-HT

- 150 and 180 max. hp from these quiet-running power plants
- Low weight/hp ratios—only 6.8 lb/BHP in the turbo-charged model
- Compact size makes repowering simple and easy
- 4-cycle economy saves on fuel costs, maintenance

and look at these low representative "fan-to-flywheel" list prices: 3 cylinder DD-169-H, $950; 6 cylinder D-298-H, $1400

Here's how you can earn more by REPOWERING WITH HERCULES DIESELS



FUEL ECONOMY

Everyone knows the one, big money-saving advantage of diesels: more ton-miles per dollar of fuel. And now Hercules makes these diesel savings available to operators of light and medium-weight trucks through its new line of light-weight, low-cost diesels. No need to pay for engine weight or horsepower you don't need: you can match a Hercules diesel to your vehicle for just the power and speed you want. And Hercules 4-cycle design really gives fuel economy, at idle or full throttle.

MAINTENANCE ECONOMY

Fleet records have confirmed that diesels normally operate up to 4 times longer than gas engines between major overhauls: require less tune-up, too, since there's less to go out of adjustment. So don't spend more money on costly gasoline engine maintenance when you can now buy economical diesels at a price you can afford. And Hercules diesel line offers complete interchangeability of high mortality parts between 3, 4, and 6-cylinder engines.

HIGHER PAYLOAD

These new Hercules diesels give big dividends in weight savings over large, over-the-road diesel engines. Each engine has been designed especially for its job and for the weight ranges of vehicles shown. As shown in our diagram, the result means as much as 850 pounds *less* engine dead-weight, 850 pounds *more* carrying capacity with Hercules diesels over other diesels offered for the same job. This means greater earning power for your trucks powered with Hercules diesels.

AND THERE'S MORE DIESEL NEWS IN THE MAKING AT HERCULES

The engines shown here are only part of the results of a 5-year development program which Hercules has conducted. Hercules research and development engineers have directed their efforts toward providing the trucking industry with diesel engines designed for—not applied to—today's requirements.

For example, here are some of the developmental engines on which exhaustive tests are now being completed: engines which will set new standards of performance and economy as vehicle power plants:

- *an aluminum V-8 truck diesel*, which will be more compact, more economical and lighter than any comparable engine available today
- *a line of "Polydiesel" engines*, to operate on diesel, gasoline, jet fuel, even kerosene *interchangeably*.

A NOTE TO TRUCK MANUFACTURERS:

You'll find that Hercules has a unique approach to diesel engines for OEM sales. It will pay you to investigate this further with your Hercules representative or by writing Hercules Motors Corp. at its Canton, Ohio headquarters.

SERVICE EVERYWHERE

Hercules has a growing, aggressive distributor organization anxious to serve you, wherever you are.

HERCULES MOTORS CORPORATION
Canton, Ohio

I'm interested in more specific information on how I can repower with new Hercules diesels:

Make & Model Truck _____ Year _____

Type of Service (check) ☐ in-city ☐ interurban ☐ interstate

Name _____

Title _____

Firm _____

Address _____

City _____ Zone _____ State _____

HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

WATCH HERCULES FOR THE "NEW LOOK" IN ENGINES

Peaking Plants-

. . . answering power demands with transportable, low cost diesel-electric units . . .

EMD's MU-42 installation arrives by rail. Transportability of units is important feature . . .

MAINE Public Service Cmpany has installed a completely transportable, turn-key diesel-powered peaking and reserve plant. Developed and built by Electro-Motive Division of General Motors, this automatic, push-button-operated generating plant points to an economic solution for a major problem confronting utility systems in many communities.

In recent years electric power demand has grown with alarming speed. How do you handle peak demand periods, quickly, economically? Can the peaking equipment also provide low cost system reserve and area protection? EMD's MU-42 peaking plant would seem to give an emphatic "yes" answer to these questions.

Maine Public Service Company's load pattern is typical. Approximately 20% of the total load on peak is only required about 2% of the time. Here's the why and how for selecting diesel engine-generator sets of this type to do the job.

Stop-and-go with 4200 kw . . .

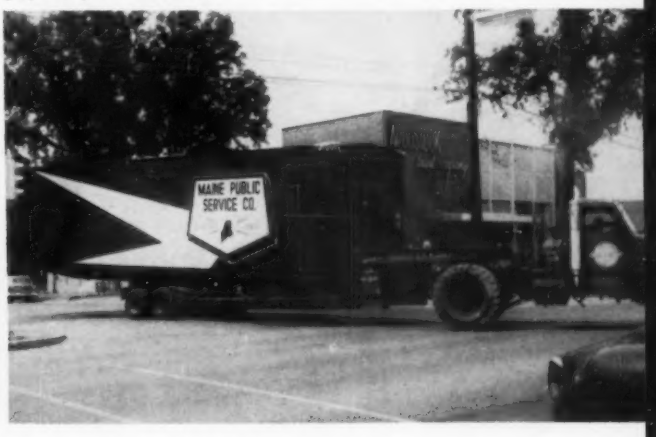
As in most cases, a study was made of the utility's load, the need for more generating capacity and the cheapest means of providing it. EMD's MU-42 diesel generating plant, rated 4200-kw, could be had for approximately $15 per kw per year. Conventional equipment for this service would cost about $28 per kw per year.

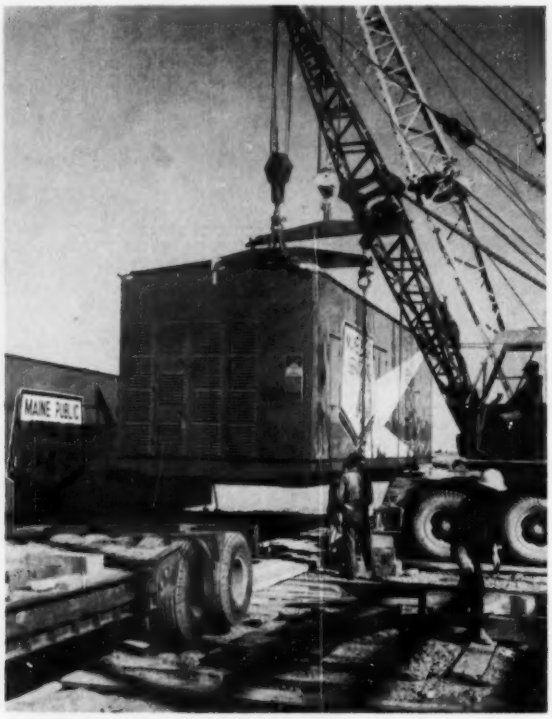
In addition to the low initial investment, automatic operation means that full-time attendance is not required. And attendance costs are a big factor in figuring the overall cost of such additional equipment.

The MU-42 can be brought on the line, at full load, in less than 90 seconds. Adding the factor of transportability, with all components housed in units that can be easily moved to location, they are extremely versatile. Area protection, often an emergency situation, is greatly simplified.

Off-loaded onto low-boy trailer, power unit heads for installation site.

Through city streets, ease of handling is graphically demonstrated.





Mobile crane lifts unit from trailer onto foundation.

Mobile, compact and quiet . . .

GM's peaking plant is the result of five years of development. Diesel engine-generating sets, even transportable packages, have been available to the utilities for many years. GM's concept was to produce a complete, standardized unit, specifically for this service and for the lowest possible cost.

Specifications came from the utilities themselves, the results of studies conducted by various companies. GM's series of generating plants were designed to meet them. They are backed by long experience in building diesel electric locomotives, power plants in themselves.

MU-42 peaking plants consist of three 1400-kw generating units, each housed in a steel, weather and soundproofed package. A control cubicle is similarly housed. As illustrated, the installation can be very compact. A stone and railroad tie or concrete foundation, cable trenches and a fuel tank, complete the installation.

MU-42 units, are a natural outgrowth of EMD's railroad locomotive line; many of the same components are used. This means mass production methods and a saving —a lower total-cost to the utilities.

Each of the power cubicles weighs about 50 tons, the control unit about 17. Each will fit a 40-ft. flat car and can be readily transferred to an over-the-road lowboy trailer. Mobility is an important feature. They can be spotted at the specific point of need, easily moved if the situation changes.

Flexible, low cost peaking plants— a growing market . . .

Today's growth patterns and power demands dictate a broad need for peaking plants, an expanding market for manufacturers of this type of equipment. Perhaps a prime consideration, from the utilities point-of-view, is the possibility of deferring a large capital investment. These flexible blocks of power can be utilized until the area load demands power generating facilities be built on a large scale.

Economy is the catch word today, in every business. GM points to several features of its peaking equipment which might well serve to sum up both the advantages from an operational standpoint, and the factors which can make it pay off for the user.

1. Low initial investment, compared to conventional generating equipment. Deferral of large capital expenditures.

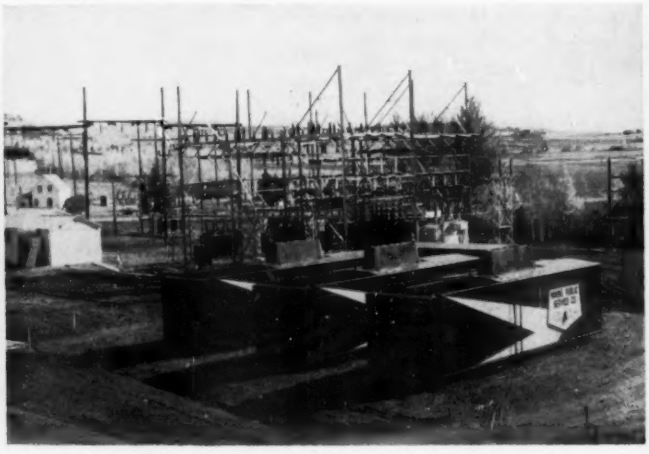
2. Automatic operation, limiting the need for full-time personnel.

3. Quick starting, on and off the line in a matter of seconds, qualifying the units as "spinning reserve."

4. Mobility—capable of being spotted on location to meet area demands.

Ballast is packed into place, cables laid in pre-planned trenches . . .

. . . and installation is ready. It can now be brought on the line in just 90 seconds.



This is the first of a two part series on the entrance of Chrysler-Deutz into the diesel market. Focusing on the service training conference held in October at the Chrysler Rye, N. Y. Training Center, this is what Chrysler is doing with regard to service and parts. The second article will outline Chrysler's sales and merchandising program.

"Diesel Power from Chrysler"

Chrysler-Deutz service training conferences prepare national sales organization for addition of diesels to its Marine and Industrial Engine line.

BEGINNING on October 6th, service and sales representatives from Chrysler Marine and Industrial Engine Division attended a Deutz diesel service conference at the Chrysler Training Center, Rye, N. Y. This was the second such conference, the first having been held in Atlanta, Georgia. In the weeks to come others will be held across the country as Chrysler sales of the Deutz diesel line gains momentum.

Chrysler's experience in the industrial engine field has proven that service and parts availability must be a keystone in their diesel sales program. Service training conferences, such as the one held at Rye, N. Y. lay a solid foundation on which to build sales.

The next conference, the largest in scope, is being held in Detroit on November 16th. Service people from the 5 regional offices will attend, as well as many others from the 12 established Chrysler-Deutz engine centers. Continual operation of the school will provide similar training for personnel from new engine centers.

With well trained service personnel, a well organized parts set up, some 25 to 30 engine centers will provide the backbone for a broad dealer system.

What about Deutz parts? Engine centers will stock a pretty complete parts inventory from which dealers can draw. Major supplies will be maintained in both Detroit and New York, and probably on the West Coast. The object—no user will have to experience unnecessary downtime for lack of service and parts. Early indications are that the engines already have won acceptance in some fields and are arousing interest in many others.

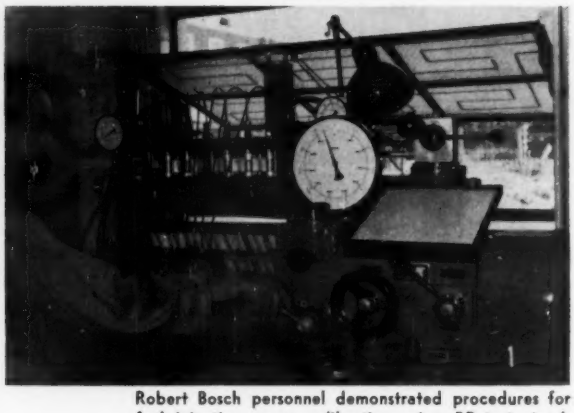
At the Rye meeting, a pattern for future conferences, East Coast regional personnel, plus service and sales representatives from two engine centers, took a long look at "diesel power from Chrysler." Here's a rundown on attendance and subjects covered.

From the Detroit office, Mr. Glen Reinders, Diesel Engineering Sales and Mr. C. V. Roman, Service Representative, conducted the meetings. Mr. Roman is one of two heading up the service training program, Mr. R. Leino working with him.

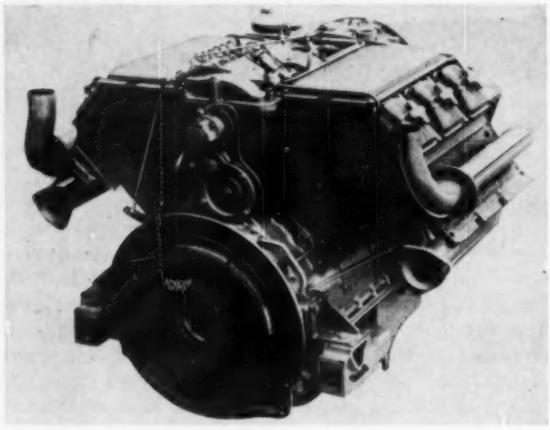
Mr. Glen Reinders opens discussion at Chrysler-Deutz service conference.

Addition of diesels to Chrysler's industrial engine line draws an attentive audience.

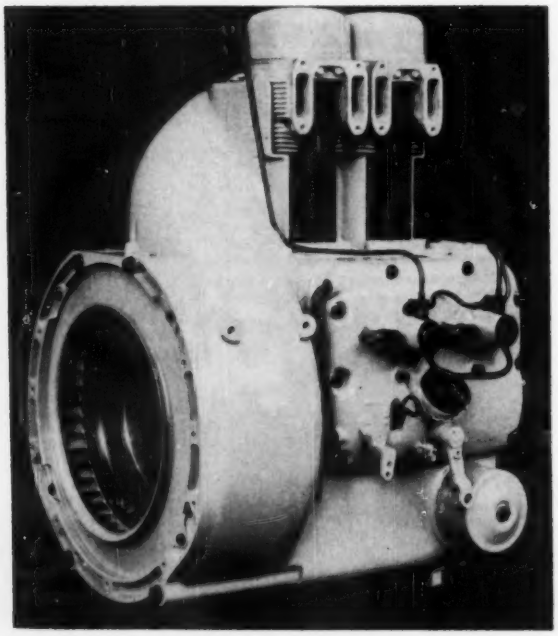
Learning by doing—dial indicator in #1 cylinder is used in timing operation. Cleanliness is learned early—note white plugs in open lines.



Robert Bosch personnel demonstrated procedures for fuel injection pump calibration using RB test stand.



Two engines were studied, the A6L-614 above and the F2L-712 below.



Together with Mr. A. G. Cunnings, N. Y. Regional Manager, four district managers covering the East Coast attended. These were Mr. S. C. Kellner, Mr. O. D. Johnson, Mr. W. DeKam and Mr. S. Minthorne.

East Coast service representatives, Mr. Jack Schuessler and Mr. S. D'Ariano were present.

Also attending were engine center executives, sales and service representatives from the region.

The first session of the conference covered introduction and orientation on sales and service; Deutz designations; parts—orders and distribution, and general service information.

Getting into the engines, everything was covered from simple start-up procedure to service and adjustment of injection equipment nad governors. This was continued on the second day together with discussions and explanations of brochures, power curves and basic application.

On the third day representatives from Robert Bosch detailed the Bosch pumps, injectors and governors. A presentation was made on three of the Bosch governors, the RQ, RQV and the RSV. Generators, starters and voltage regulators, with regard to what can and cannot be done in the field were covered. Facilities of the Robert Bosch Service Organization wound up this session.

On Friday, the fourth day of the conference, a presentation was made by Mr. Phil Adolph, Project Engineer, Diesel Energy Corporation of New York. This organization is the Deutz subsidiary in the United States. Operation of Deutz fuel pumps, Deutz governors, cooling operation and application of variable speed blowers were covered. Later, there was a period of shop practice during which injection timing and general trouble shooting got a going over.

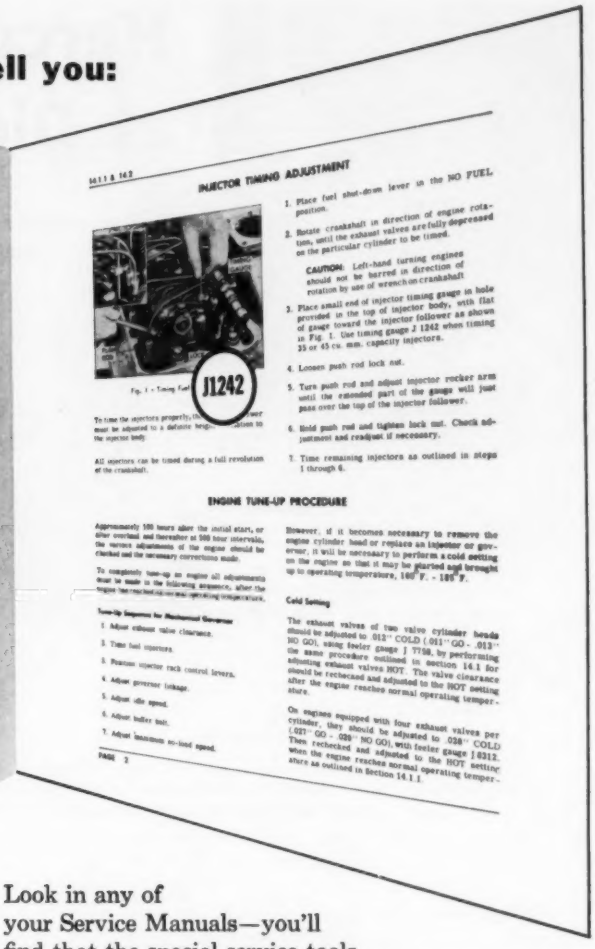
A brief morning session was held on Saturday, and on Monday talks on sales got under way. On Tuesday, accessory design, application, a broad discussion of diesel economy-dependability finished up the conference.

These service training meetings are a strong indication of the importance Chrysler is attaching to the service and parts phase of their entrance into the diesel market. And there is a sure awareness among all of the Chrysler-Deutz people we talked with as to the great potential of this market.

With a rugged, hard-working line of engines to sell, Chrysler is out to get its share of the diesel market. In January we'll report on their marketing plans.

your service manuals will tell you:

K-M SPECIAL SERVICE TOOLS ARE FACTORY RECOMMENDED!



14.1.1 & 14.2

INJECTOR TIMING ADJUSTMENT

Fig. 1 - Timing Fuel

To time the injectors properly, the ... must be adjusted to a definite heig... the injector body.

All injectors can be timed during a full revolution of the crankshaft.

1. Place fuel shut-down lever in the NO FUEL position.
2. Rotate crankshaft in direction of engine rotation, until the exhaust valves are fully depressed on the particular cylinder to be timed.

   CAUTION: Left-hand turning engines should not be barred in direction of rotation by use of wrench on crankshaft
3. Place small end of injector timing gauge in hole provided in the top of injector body, with flat of gauge toward the injector follower as shown in Fig. 1. Use timing gauge J 1242 when timing 35 or 45 cu. mm. capacity injectors.
4. Loosen push rod lock nut.
5. Turn push rod and adjust injector rocker arm until the extended part of the gauge will just pass over the top of the injector follower.
6. Hold push rod and tighten lock nut. Check adjustment and readjust if necessary.
7. Time remaining injectors as outlined in steps 1 through 6.

ENGINE TUNE-UP PROCEDURE

Approximately 100 hours after the initial start, or after overhaul and thereafter at 500 hour intervals, the various adjustments of the engine should be checked and the necessary corrections made.

To completely tune-up an engine all adjustments must be made in the following sequence, after the engine has reached its normal operating temperature.

Tune-Up Sequence for Mechanical Governor

1. Adjust exhaust valve clearance.
2. Time fuel injectors.
3. Position injector rack control levers.
4. Adjust governor linkage.
5. Adjust idle speed.
6. Adjust buffer nut.
7. Adjust maximum no-load speed.

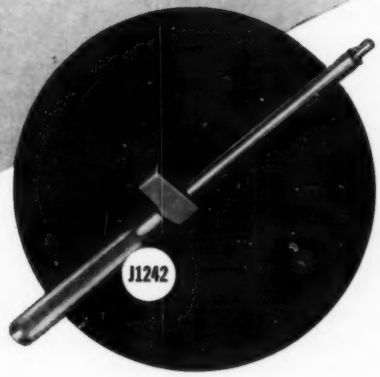
However, if it becomes necessary to remove the engine cylinder head or replace an injector or governor, it will be necessary to perform a cold setting on the engine so that it may be started and brought up to operating temperature, 160° F. - 180° F.

Cold Setting

The exhaust valves of two valve cylinder heads should be adjusted to .013" COLD (.011" GO - .013" NO GO), using feeler gauge J 7788, by performing the same procedure outlined in section 14.1 for adjusting exhaust valves HOT. The valve clearance should be rechecked and adjusted to the HOT setting after the engine reaches normal operating temperature.

On engines equipped with four exhaust valves per cylinder, they should be adjusted to .026" COLD (.025" GO - .026" NO GO), with feeler gauge J 8312. Then rechecked and adjusted to the HOT setting when the engine reaches normal operating temperature as outlined in section 14.1.1.

PAGE 2



Look in any of your Service Manuals—you'll find that the special service tools recommended are J-number tools, the coded name for Kent-Moore "Rate Maker" Special Service Tools. The reason for this factory recommendation is simple: Long before many of the parts and equipment on your trucks or engines were in production, Kent-Moore engineers were working in close cooperation with the manufacturer, designing the correct time-saving tools for every maintenance and repair job.

What's more, "Rate Maker" Special Service Tools prevent parts damage that can occur through the use of "makeshift" tools. It pays to use J-numbered tools—the special service tools that are not only designed for the job, but *factory recommended* as well!

For complete information on the entire line of Kent-Moore tools for the equipment you operate and service, write for your free catalog today; there's no cost, no obligation.

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60-H1

Hercules "New Look" at Diesels . . .

a management-merchandising concept points to the unlimited opportunities that lie ahead for the diesel industry.

"This new line is expected to create an entirely new market for Hercules," according to president W. L. Pringle.

"Product development is keyed to the management concept," says assistant to the president, A. E. Bigelow.

Intently watching engine tests, sales manager W. F. Humphrey, left, and Dr. E. A. V. Horiak see the product from their separate points of view.

A new line of diesel engines is always big news in the industry. Early this month Hercules introduced a new power series that is something more than "big news." Aimed smack dab at the light and medium-weight vehicle field, it represents a new kind of thinking that should have great impact throughout the industry.

Here, based on talks with management and sales executives, is the story of how the new engine line came into being, where and how it is being marketed.

A "new look" at and for diesels . . .

The basic concept, evolved by Hercules' new and vigorous management, was to manufacture and sell, at *low initial cost*, a line of engines that would lend diesel economy and reliability to just about any size vehicle. More specifically, from 3000 gvw to 24,000 gvw. Of course, they have engines for right on up to 55,000 gvw. These include the "Polydiesels" for application in heavier vehicles, and with multi-fuel c pability, of strong interest to the military.

The breakthrough, obviously, is in *low initial cost*. For example, the 3-cyl DD-169-H, "fan-to-flywheel," lists at $950. That's between $15 and $16 a horsepower. Prices for the 4-cyl and 6-cyl engines are just as attractive.

A strong contributing factor in bringing costs down is maximum interchangeability of parts between all engines. This meant longer production runs. Naturally, it simplifies service and parts work.

Looking back at the history of the Hercules Co., this has taken considerable doing. As far back as 1938, Hercules had a re-powering set-up and though the climate wasn't right then, and it definitely is now, recognition of the market potential existed. When, some two years ago, Mr. William L. Pringle took over the reins of the company, corporate sights were brought to bear right on this target.

Reorganization brought more automotive talent into the firm, from top management down through production and even into engineering. Meanwhile, Director of Engineering Dr. E. A. V. Horiak, began developing an engine line to match management's marketing concept. Impetus was added to the program as cost-conscious fleet operators began demanding just the sort of product line that Hercules was busy tailoring.

Support came from many directions. A grass-roots market survey showed tremendous interest among smaller fleet owners. The industry's leading publication (DIESEL POWER) was talking about market potential, pointing the way with taxicab installation stories, pushing for industry expansion into the light truck field. Figures tell the story.

In 1958 there were some 590,000 trucks built under

New 6-cyl diesel repowers this 22,000 lb class truck—a visualization of the market potential.

"Polydiesel" being work-tested in materials handling equipment—here a straddle carrier for steel mill operations.

14,000 pounds gvw, more than half of total truck production in all weight classes. In that year only about 160,000 diesel engines of all sizes were manufactured in this country. Obviously, it wouldn't take much of a penetration into the light truck field to double the total number of diesels produced.

Operating costs continued to spiral upwards, making diesel economy all the more desirable. Low cost lightweight, high-speed, diesel engines were in demand in other applications, materials handling equipment, farm tractors and small power sets.

Vital user applications . . .

The acid test came as soon as engines were ready to go into over-the-road tests in actual service. Repowering has begun, from pick-ups to light vans to trailer tractors. It wasn't long before Hercules began to pile up evidence to back up the sales program planned.

In Los Angeles, a pick-up to run over freeways and in stop-and-go traffic has its operator tickled pink. A short-haul trucker, making one installation, wants more. Fleet interest was proving that indeed, the climate was right for dieselization of light vehicles. Hercules was ready with potent ammunition.

On the sales line . . .

With user interest running high, Hercules put into action a broad plan to review and strengthen its distributor organization. They were looking at three key points: facilities, personnel and location. All would be brought into line with the new target—truck service. Parts, service and sales would be ready to work a smooth triple play when Hercules went to bat with its new engines.

None of this just happens. There is a science to setting up parts and service; setting it up right. In the meanwhile, Hercules contined and will keep right on serving the broad section of the industrial market where they have built a solid reputation over the years. A part of the foundation they are building under their new line is aimed at continual improvement of their industrial position.

Sales and service personnel were educated to the new engine line. Repowering was the key sales objective. More miles of operation would go on record and OEM sales would blossom from the practical seeds sown with satisfied users.

Repowering kits, packaged for maximum ease of installation, will be available. Sales aids will make repowering a forceful presentation. An example, a repowering chart. It lists all major trucks, their OEM power, and the Hercules diesel recommended for repowering. It tells what this diesel will do in power, economy and reliability. All pertinent specs are listed as well. With such sales tools, salesmen can trace a repowering picture across the broad range of vehicle sizes, wherever diesels can do a better, cheaper job than can gasoline power.

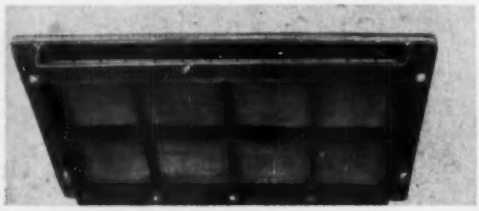
On the right road . . .

Hercules merchandising plans for the new engines is important on an industry-wide basis. Diesels can and are doing an increasingly significant job in light vehicular service. Penetration into taxis, light trucks, short-haul, light-load vehicles, fork lifts and straddle carriers—all means a bigger, more dynamic diesel industry. Repowering is the wedge into the OEM markets that can easily double and even treble diesel engine production.

Gone are the days of the mistaken conception of big, heavy and expensive diesels, good only for cumbersome, slow service. Hercules, with its "new look" in diesel engines, and with the marketing concept behind them, gives substance to the unlimited opportunity we have been pointing to for the whole diesel industry.

New Approach to Explosion Relief Valves

by Max O. Bunge, General Supt.
Tacubaya Diesel Plant, Mexican Light & Power Co.



Oil-wetted flame trap, after an English design, effectively suppressed explosion's flame.

Lightweight aluminum flap valve in open position. Valve is lightly loaded by easily pre-set double-coil spring.

In test vessel explosion, valve opened rapidly. Only a white cloud was emitted which proved non-flammable.

"ELIMINATE crankcase explosions" has been a mandate ever since this potential hazard has been known to exist. Investigators have probed and pried to better understand the nature of the factors involved. Much progress has been made. Yet as long as hydrocarbons are used for crankcase lubrication and gases can be formed, a potential danger exists.

One approach to a solution has been development of detecting devices to warn of hazardous conditions. These minimize, but do not eliminate the potential danger. The second and most practical approach is to render any explosion that may occur harmless to personnel and equipment. Hence, explosion relief valves.

Long personal experience with such valves, all of the poppet type, showed them to have certain disadvantages. The mass of moving components, opposed by strong spring pressure, was such that considerable pressure was required to lift the valve and this allowed dangerous pressure levels to build up in the crankcase. Once the valve opened, gases were deflected 90 degrees and this impeded the rapid pressure relief necessary.

Flapper valves, a new approach . . .

These shortcomings led me to development of a flap-type valve. It is made of lightweight aluminum for rapid action and is loaded by means of a double-coil spring. The valve plate also acts as a deflector of escaping gases. The spring is arranged for easy presetting of the desired opening force. The seal is half-round neoprene, permanently attached to the crankcase cover.

A test vessel was constructed to check valve effectiveness. During experiments it was set to open at 0.2 psi. To get the strongest possible explosion in the test vessel gas-air proportion was varied until the optimum was attained. Fire shot out the valve for approximately five feet.

In repeated tests, the valve opened quickly and also closed rapidly as confirmed by formation of a strong vacuum in the vessel after each explosion. Quick opening is shown by the fact that only insignificant pressure rise in the vessel was recorded, in most cases, approximately 1 psi. Only once was a momentary 3-psi pressure noted.

For comparison, a conventional type of relief valve, spring-loaded to open at 2½-psi pressure, was installed at the opposite end of the vessel. Its area was 205 sq. in. compared to 99 sq in. for the flap valve. At no time did it open, showing the relative effectiveness of the two valves in preventing pressure buildup in the vessel.

Handling flames . . .

Fire issuing from a valve, even though deflected, is undesirable. Also, accompanying noise is startling and should be eliminated. Experiments carried out by Mr. W. P. Mansfield in England during 1956 proved conclusively that a properly-designed flame trap was 100% effective in suppressing flame. A trap was designed to conform with Mr. Mansfield's principles and installed inside the test vessel ahead of the flap valve.

The screen was properly wetted down with SAE No. 30 lube oil before each explosion to simulate conditions in a running engine. Repeatedly, the valve opened rapidly with a subdued "swoosh" and emitted only a cloud of white smoke. The trap had no effect on the recorded pressure rises.

To prove that the white smoke cloud was harmless, a rag soaked in kerosene was placed a foot away from the valve in the path of the smoke cloud. This rag was set afire before each explosion was set off. At no time did the white smoke cloud ignite but the rag fire was extinguished. This corroborated tests made in England showing the cloud to be harmless and not subject to ignition.

To insure a still greater safety factor, it would be advisable to install screen flame traps at each crankcase partition to subdue the force of an explosion and confine it to the section of origin. This scheme was developed

(*Continued on page* 61)

New Eaton Process Cuts Costs of Alloy-Faced Valves

The new Eaton ECONOSEAT process of applying heat resistant and corrosion resistant material to valve faces makes possible a worthwhile reduction in the amount of costly protective alloys required.

If you have hesitated to use high-alloy-faced valves because of cost—or are now using valves conventionally faced and are interested in reducing costs—you will want complete information about the advantages of Eaton ECONOSEAT Valves. Eaton engineers will be glad to consult with you without obligation.

EATON

Call on Eaton engineers to discuss with you the possibilities of applying the ECONOSEAT process to parts, other than valves, requiring protective coatings.

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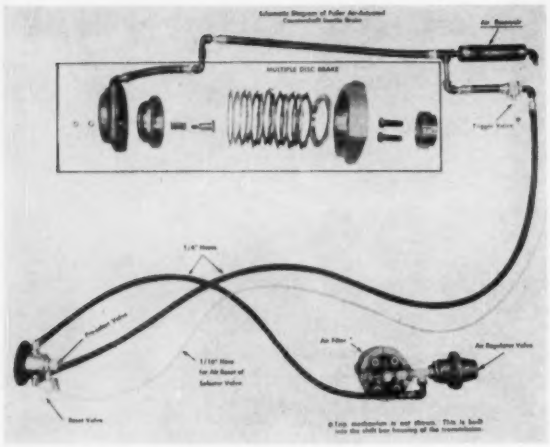


Up shifting simplified for heavy-duty rigs through use of new countershaft brakes . . .

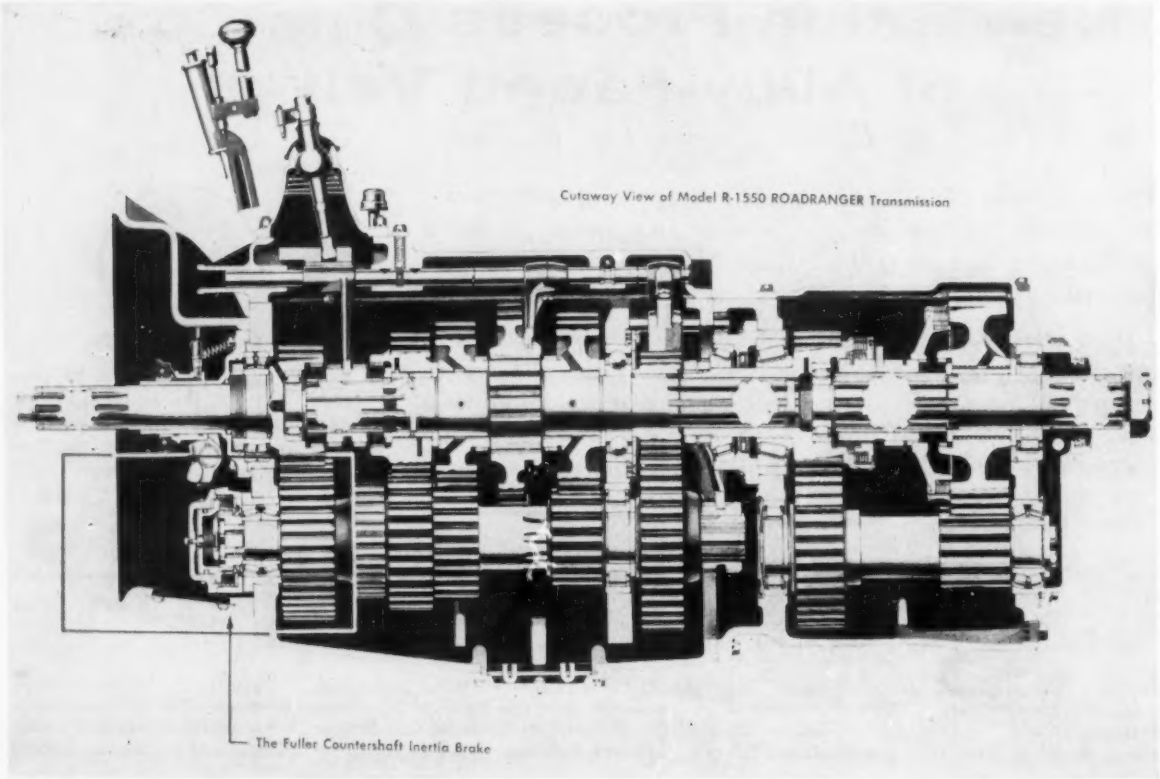
Inertia brakes eliminate double-clutching

HITTING gears "right in the belly" gets tougher with big rigs, particularly heavily-loaded off-highway equipment. This is an inelegant way of describing a successful double-clutching during gear shifting.

Double-clutching depends on engine deceleration to synchronize speeds of the two gears to be engaged. With heavy vehicles, deceleration of the rig is faster than normal engine deceleration. The problem becomes acute on up-shifting. Miss, and you stand a good chance of grinding a few pounds of gears.

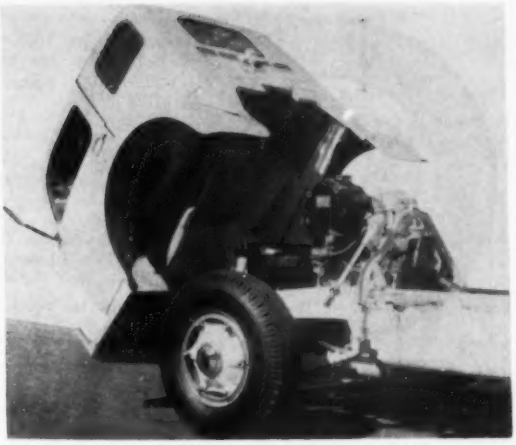
Fuller Manufacturing Company has come up with a

(*Continued on page* 61)



diesel power » new products

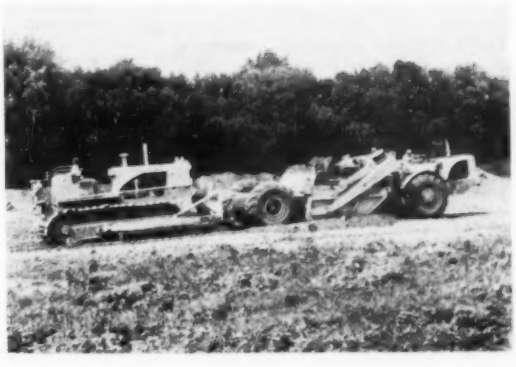
NEW DIESEL-POWERED EQUIPMENT INCLUDES:



First White city-pickup-and-delivery truck is powered by a 6-cyl Cummins JN-130 diesel rated 130 hp at 2500 rpm. New tilt-cab White 3016D has synchronized 5-speed transmission, Clark Equipment-developed air suspension and extra-short 97½-in. wheelbase. Truck was developed for economical, low-maintenance operation in congested areas requiring maximum maneuverability.

GM 4-71 powers new Trojan 304 tractor shovel. Engine was chosen after testing where it proved up as a highly productive, light-weight unit. Smaller size per hp makes compact, easy to service power plant. New Trojan 304 3-cu yd 4-wheel drive shovel offers fast acceleration and real working ability.

Called the "GOER" for its go-anywhere ability, new LeTourneau-Westinghouse off-highway military vehicle goes over rough terrain or floats on inland waterways. New vehicle reverses usual development trend. Commercial earth-moving equipment components were assembled in new design. Cummins V8 diesel is same as engine used in "V-Power" C 'Pull. Power steering and control system, electric drive-assist powering rear wheels, power train, basic transmission and clutch are all standard units used in firm's commercial line.



IH's newest and most powerful crawler, TD-25 push-loading a Payscraper. Unit is available in either torque converter or gear-drive. Both are powered by International's turbocharged 6-cyl DT817 diesel having 230 net hp at the flywheel at 1500. Sixth new crawler out of the IH stable this year, TD-25 is their most powerful. Long list of advanced features are worth looking into if you're moving a lot of earth.

FOR MORE DETAILS ON THESE ITEMS USE THE READERS SERVICE CARD

MORE NEW PRODUCTS FOLLOW ►

LOOK for this Seal of the ASSOCIATION of DIESEL SPECIALISTS when you need Specialized Service for your engines.

identifies Qualified ADS Members
symbolizes Know-How—Modern Facilities—Ethics
guarantees work performed by Factory-Trained Technicians using Factory-Approved Methods with Best Materials

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F—Fuel Injection Equip. A—Engine Accessories & Specialties C—Engine Components & Parts
G—Governors T—Specialized Tooling & Test Equip. E—Electrical Equipment

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DIESEL FUEL INJECTION SERVICE
365 N. Royal Street
F A C Mobile, Alabama
G T E Tel: HE 2-7513

ARIZONA

PERKINS DIESEL SERVICE
747 South Country Club Drive
F A C Mesa, Arizona
G T E Tel: WOodland 4-5273

CALIFORNIA

DIESEL CONTROL CORPORATION
226 No. Marine Avenue
F A C Wilmington, California
G T Tel: TErminal 4-8516

CONNECTICUT

W. J. CONNELL CO. OF HARTFORD
85 Airport Road
F A G Hartford 14, Conn.
T E Tel: JA 5-3401

CLARK-SON CO., INC.
354 Davenport Avenue
F A C New Haven, Conn.
G T E Tel: STate 7-6746

FLORIDA

DADE DIESEL COMPANY
2717 N.W. 54th Street
F A C Miami 42, Florida
G T Tel: NEwton 4-3063

FLORIDA DIESEL & ELECTRIC CO.
1930 No. Miami Avenue
F A G Miami 32, Florida
T E Tel: FRanklin 1-7691

GEORGIA

AUTO ELECTRIC & MAGNETO COMPANY
477 Spring Street N.W.
F A G Atlanta 8, Georgia
T E Tel: JAckson 3-5831

ILLINOIS

ILLINOIS AUTO ELECTRIC CO.
2011-37 Indiana Ave.
F A C Chicago 16, Ill.
G T E Tel: CA 5-4444

KENTUCKY

DIESEL INJECTION SERVICE CO.
805 Mulberry St.
F A C Louisville 17, Ky.
G T E Tel: MElrose 5-7731

LOUISIANA

WOMACK BROTHERS DIESEL SERVICE
3983 Airline Highway
F A C Baton Rouge, Louisiana
G T E Tel: ELgin 7-9666

VAUGHAN & BUSH, INC.
605 West First Street
F Bossier City, La.
Tel: 5-7404

GERHARDT'S INC.
819 Central Avenue
F A G New Orleans 21, La.
T Tel: VErnon 3-7254

JOHN M. WALTON, INC.
1050 Carondelet Street
F A C New Orleans 13, La.
G T E Tel: JAckson 5-0556

MAINE

EASTERN DIESEL SERVICE COMPANY
997 Congress Street
F A G Portland, Maine
Tel: SPruce 3-1082

MARYLAND

MECHANICAL EQUIPMENT CO.
2140 Hartford Road
F A G Baltimore 18, Md.
T Tel: Tux 9-7607

PARKS & HULL AUTOMOTIVE CORP.
1033 Cathedral Street
F A G Baltimore 1, Md.
T E Tel: SA 7-8383

MASSACHUSETTS

BOSTON FUEL INJECTION & ENGINE SERVICE CO., INC.
263 Northern Avenue
F A G Boston, Mass.
T Tel: Liberty 2-6646

W. J. CONNELL COMPANY
210 Needham Street
F A G N. Upper Falls 64, Mass.
T E Tel: DEcatur 2-3630

C. A. KROHNE & SONS
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F A C Springfield 5, Mass.
G T E Tel: RE 2-7441

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KNORR-MAYNARD COMPANY
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F A T Detroit 2, Michigan
E Tel: TRinity 2-2200

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DIESEL SERVICE COMPANY
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F A C Hibbing, Minn.
G T E Tel: AMherst 3-5725

DIESEL SERVICE COMPANY
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G T E Tel: PArkway 1-5065

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F A C Jackson, Mississippi
G T E Tel: FLeetwood 5-3439

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DIESEL FUEL INJECTION SERVICE, INC.
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F A G St. Louis 25, Mo.
T Tel: VErnon 2-2121

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A & D DIESEL SERVICE, INC.
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T E Tel: STerling 8-4222

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F A C Buffalo 9, New York
G T E Tel: GRant 7602

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DIESEL INJECTION SALES & SERVICE
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G T Tel: FRanklin 5-4152

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T Tel: ED 4-8225

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3015 Hillsboro St.
F A C Raleigh, N. C.
T G E Tel: TE 4-5553 TE 4-2316

ASSOCIATION of DIESEL SPECIALISTS, INC.

For information contact:
S. E. Franklin, Secretary, P. O. Box 1116, Wilmington, Calif.
Next Meeting — Theme "Operation Mile High."
February 19-21, 1960, Cosmopolitan Hotel, Denver, Colorado.

NORTH DAKOTA

MIDLAND DIESEL SERVICE & ENGINE CO.
25 — 28th St. S.W.
F T Fargo, North Dakota
Tel: ADams 2-5578

OHIO

STANDARD MOTOR PARTS, INC.
200 Carroll St.
F A C Akron 4, Ohio
G T Tel: JEfferson 4-7143

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AMERICAN ELECTRIC IGNITION CO.
124 N.W. Eighth Street
F A C Oklahoma City, Oklahoma
G T E Tel: FOrest 5-6494

OREGON

AUTOMOTIVE PRODUCTS, INC.
1700 S.E. Grand Avenue
F A G Portland 14, Oregon
T E Tel: BElmont 4-5241

PENNSYLVANIA

PENN DIESEL SERVICE CO.
100 Prince St.
F A G Harrisburg, Penna.
T Tel: KI 5-8530

PENN DIESEL SERVICE CO.
27th & North Church Streets, RD#1.
F A C Hazleton, Pa.
G T Tel: GL 4-6771

GENGLER'S DIESEL SERVICE & SALES
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F A C Mount Carmel, Pa.
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F A C Philadelphia 37, Pa.
G T E Tel: Pioneer 3-3773

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401 Chestnut Street
F A G Chattanooga 2, Tennessee
T E Tel: AM 7-6752

M & M FUEL INJECTION SERVICE
F A G 2511 Broad Ave.
T Memphis 12, Tenn.

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1301 Lexington Boulevard
F A T Corpus Christi, Texas
E Tel: TU 2-8662

MAGNETO & DIESEL INJECTOR SERVICE
6931 Navigation Blvd.
F A T Houston 11, Texas
E Tel: WA 1-4830

WOMACK BROTHERS DIESEL SERVICE
123 West Carolina St.
F A C San Antonio, Texas
G T E Tel: LE 2-1182, LE 4-5445

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808 Union St.
F A C Norfolk 10, Va.
T G E Tel: MAdison 2-3103

DIESEL INJECTION SALES & SERVICE, INC.
910 North Boulevard
F A C Richmond, Va.
G T Tel: EL 8-8170

DIESEL INJECTION SALES & SERVICE, INC.
1016 Delaware Street
F A C Salem, Virginia
T G E Tel: DU 9-7296 & DU 9-7297

WASHINGTON

SEATTLE INJECTOR & ELECTRIC CO.
2706 2nd Avenue
F A C Seattle 1, Washington
G T E Tel: MA 3-1135

WISCONSIN

FUEL INJECTION & ELECTRIC, INC.
932 No. Jackson St.
F A G Milwaukee 2, Wisconsin
T E Tel: BRoadway 2-0818

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VAN'S DIESEL SERVICE
119 Second St.
F A C Juneau, Alaska
E Tel: 6-1670

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P.O. Box 263, Station U
Toronto 18, Ontario, Canada

UNITED STATES AVIEX CO.
423 North 9th Street
Niles, Michigan

New Gerin Oil Condition Indicator Serves All Engines

New Gerin model DG meter now serves all engines including gasoline. Indicator accurately gauges the condition of engine oil by detecting any change in viscosity.

An excellent preventive maintenance tool, the Model DG warns of oil dilution or filter failure. It can be read whether the engine is running or stopped since meter pointer then remains on reading position. Model DG meter is not affected by changes in temperature, reacting only to changes in viscosity.

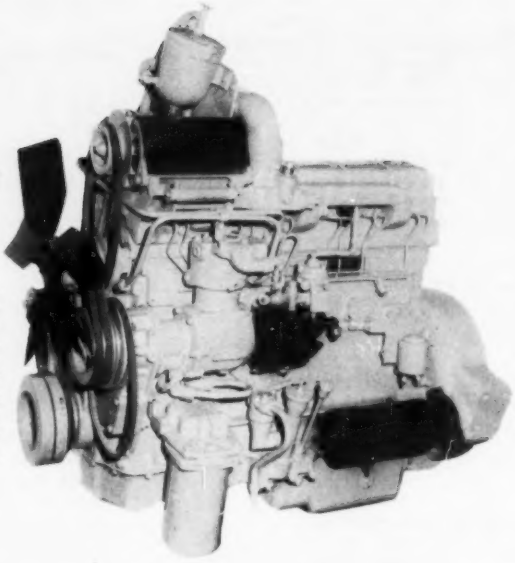
The many advantages of this type of meter make it really worth looking into.

Onan 25-kw Electric Plant Uses Hercules Diesel

Onan's new smooth-running, full-rated 25-kw engine-generator set (Series DZC) is suitable for both primary and emergency standby applications. Where dependable continuous power is needed—in oil fields, construction jobs, mining camps, etc.—it's ready for full-time service. Dependability and easy starting make it equally suitable for standby use.

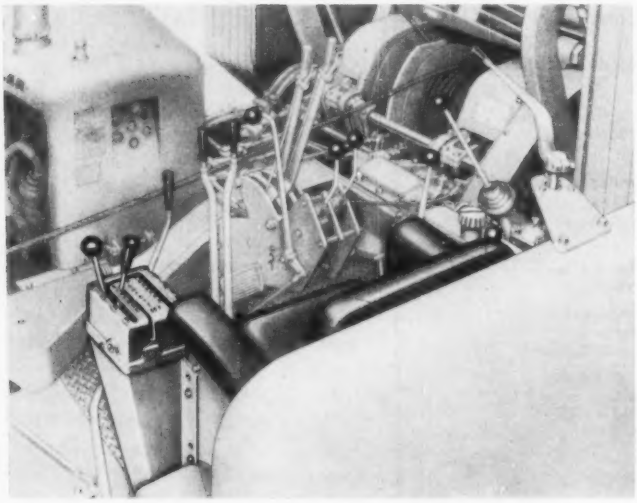
Prime mover for the DZC Series is Hercules' 4-cyl, 60-hp (at 1800 rpm) DD-226 diesel engine. Generator is of the new "magneciter" type featuring faster voltage recovery with less voltage fluctuation. All moving parts in the exciter and voltage regulator are eliminated, promising reliability and less maintenance.

NEW PRODUCTS . . .



Cummins' new C-160 6-cyl engine develops 160 hp at 2500 rpm. It is already making news in repowering—the key is in its new weight of 1555 lbs including standard accessories. Bore and stroke are 4 7/16 in. by 5 in., and its piston displacement is 464 cu in. A turbocharged version, the C-175, developing 175 hp is also available.

Model EFG is Westinghouse's new electrical frequency-sensing governor. Designed for constant speed control over a 10% range in 400 cycle service, and over a 30% range in 50/60 cycle service, EFG does not need an accurate and sensitive speed drive accessory in the engine. Other features: isochronous in single or parallel unit operations; independence of throttle linearity and of load balance for phase and load power factor; maintenance of constant speed to full capability of the engine to carry load, including overload. Bottom unit is sensing element, top unit hydraulic actuator. Scale is in inches.

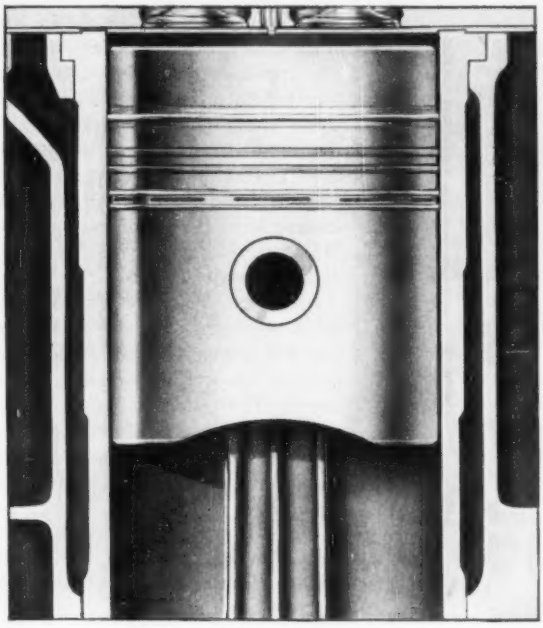


Split-path engine torque transmission is new concept in transmittal of pipelayer power now available on the Caterpillar 583. New transmission gives instantaneous, one-lever control of gear shifting without interruption of power and momentum. Heart of new transmission is a planetary gear set which transmits 1/3 of engine torque direct to transmission input shaft, remainder through the torque converter. Horsepower has been increased from 225 to 235. Single speed-range selection lever replaces three levers controlling gear selection, flywheel clutch operation and forward-reverse movement.

MORE NEW PRODUCTS FOLLOW ►

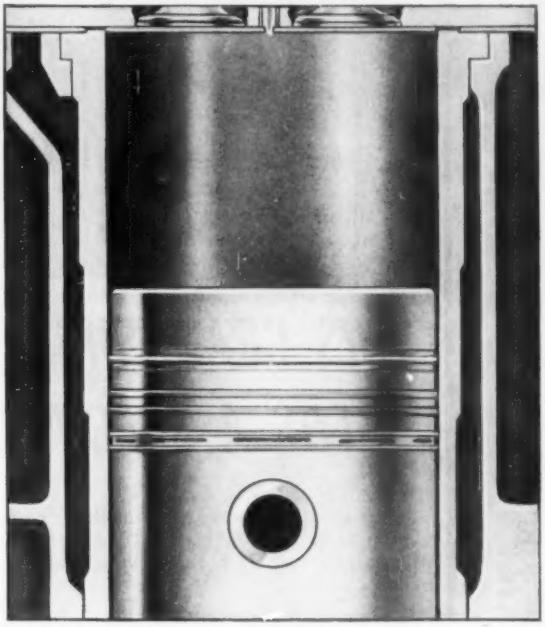
Maintain M.E.P. with Perfect Circles!

Pre-seated hard solid chrome face finish on Perfect Circle piston rings gives full-stroke power protection to maintain Mean Effective Pressure...



HERE!

...at the moment of ignition when compression and temperature changes are greatest, PC rings maintain Mean Effective Pressure for sustained power.



HERE!

...near the completion of the power stroke when diesel combustion pressures continue to be high, PC rings resist sustained temperatures and pressures to maintain M.E.P. for full stroke power.

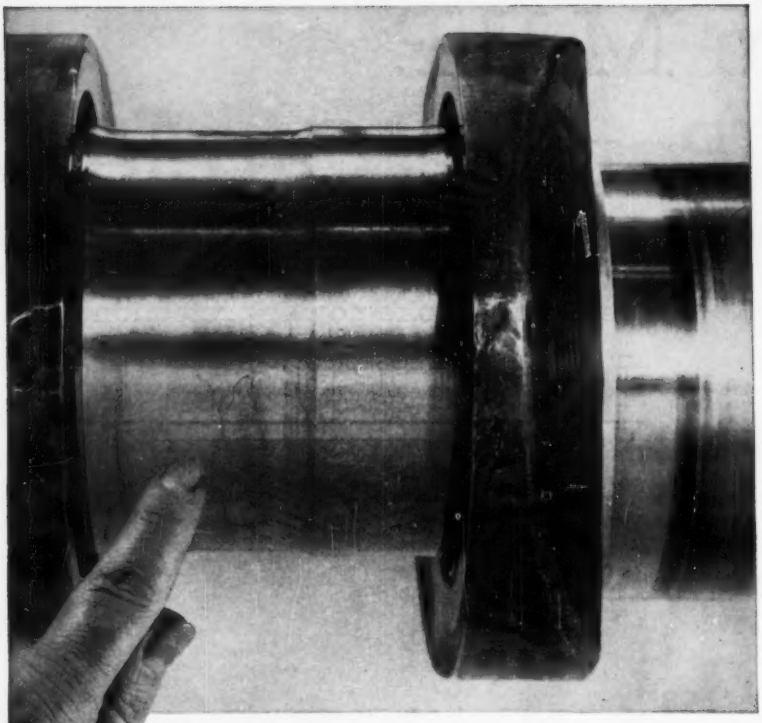
CHROME PLATED SURFACES on top compression ring and oil ring resist extremely high diesel pressures without scuffing or scoring. The result: thousands of hours of positive oil control and double life for pistons, rings, and cylinders!

PERFECT CIRCLE

PISTON RINGS — POWER SERVICE PRODUCTS

Hagerstown, Indiana

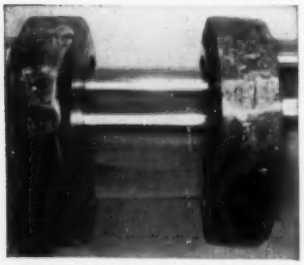
In Canada: Don Mills, Ontario



THIS CRANKSHAFT JOB NEEDS A SPECIALIST

This is specialized work, rebuilding crankshafts—intricate, exacting, and naturally expensive. It's the kind of work that demands a specialist . . . and we are just that!
We've specialized in rebuilding crankshafts, because since 1916 we've *made* crankshafts. And who knows better than a maker what are the "musts" of a sound, economical repair job. We'll take your worn crankshaft and rebuild it, if salvagable, through the carefully controlled steps of grit blasting, replating, regrinding and thorough inspection. And we'll deliver it back with a guarantee for 100% performance that only a manufacturer-specialist can provide. May we quote on your next job?

For more details on crankshaft repair write for Bulletin RC-3



This is a finished, repaired crankshaft, after processing by National Forge.

NATIONAL FORGE COMPANY
IRVINE, WARREN COUNTY, PA.

NEW PRODUCTS . . .

(*Continued from page 46*)

Slip-Pointer and Follow-Up Pointer "Torqometers" Announced

New tools from Snap-On, available on a special order basis, are similar to standard series of "Torqometers" but differ in method of use. Designed primarily for inspection work, they will be of interest to quality control departments.

Pointers on these units work in either direction on the dial, depending on use on either right or left hand threads. They are available with ¼-in., ⅜-in., ½-in., ¾-in. and 1-in. square drive, ranging from 0-15-in. pounds to 0-1000 ft pounds.

Slip-Pointer unit needle does not move until torquing operation is completed. Needle moves to measure exact amount of torque applied when pressure is released. It will retain its reading until the dial face is turned. This feature makes it easy to test in dark or restricted areas.

Follow-up Pointer "Torqometer" has 2 needles. Both move as long as pressure is applied. One needle drops back to zero when pressure is released. The other remains at the reading attained. This needle may be adjusted to zero, or to any desired reading by turning the entire dial assembly.

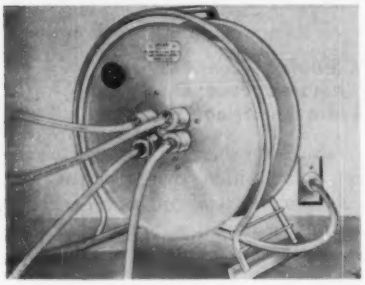
There is more dope available on these two special tools. Fill in the Reader Service Card and we'll see that you get it.

Water Pump Impeller and New Shaft Seal From Schwitzer

New water pump impeller, when used in combination with an improved automatic shaft seal, is said to eliminate most common water pump leaks. Impeller has ceramic nose, permanently bonded to the casing. Automatic shaft seal has a molded carbon alloy washer which makes contact with impeller's ceramic washer. Since both contacting surfaces are inert materials, corrosion and deterioration are practically eliminated.

Manufacturer states that both impeller and seal are interchangeable with original water pump components. Available only in production quantities, new products have application in truck and heavy-duty equipment pumps.

Four Outlet Portable Cord Reel



Need multiple outlets in a corner of your shop, or somewhere on the job? Daniel Woodhead Co. has a new unit featuring four "U" blade type receptacles. Reel has a cord capacity of 375 ft., depending on cord size used. Well built, this portable unit should solve a problem in a good many situations where power outlets are needed for several jobs, from one power source.

New Pressure Radiator Cap Takes Heat Off Cooling System Servicing

Ever pulled the cap off a hot radiator and felt the steam? This safe and practically designed pressure cap should find wide application. Here's how it works.

If heat is sensed in the engine housing, a button in the SaFE-T-Cap is depressed and pressure is allowed to vent out the radiator overflow. The cap can then be safely removed.

Want to make cooling system servicing easier, safer for your personnel, and for attendants? Looks like new SaFE-T-Cap will do the trick.

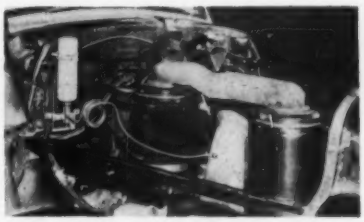
New Electro-Pneumatic Control Unit Promises Accuracy and Protection

Synchro-Start has designed an Electro-Pneumatic Control Unit that has a number of excellent features. It gives accurate, on the second, cranking cycles as well as protection for the engine. Relays are locked in sockets by closing front panel. Overload breakers eliminate necessity of carrying spare fuses.

Individual adjustment for each of the three Electro-Pneumatic units, from 0 second to 120 seconds is another feature. Being pneumatic, precision timing is insured regardless of battery voltage variations.

Here's a control unit that should give excellent trouble free service.

Quick Cold Weather Starts



A simple, inexpensive to install Quick-Start system is now available from the Turner Corporation. It operates on a specially compounded ether-base mixture and delivers a "hot" boost for starting diesel engines in temperatures as low as −65°F.

As illustrated, installation is simple. A special choke is installed on the dash. It activates the system, injecting the Quick-Start mixture into the air intake of the engine.

Same starting fluid is available in a pressurized spray can. Both will help you start equipment in all types of weather.

Reliance
SINCE 1909

When you order new equipment, specify Reliance. When you overhaul, replace with Reliance. You get the most accurate, rugged, highest quality instruments money can buy! Write us your needs and we'll give you fast custom service. Remember, you can ALWAYS "rely on Reliance!"

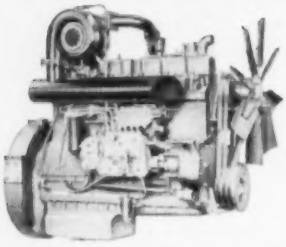
TACHOMETERS
FLEXIBLE SHAFTS
ADAPTERS
CLUTCHES

A new Catalog is yours for the asking

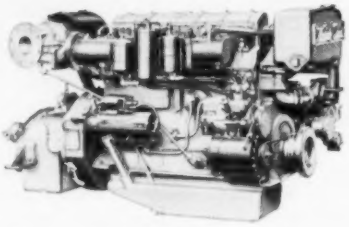
BARBOUR STOCKWELL INSTRUMENTS
A DIVISION OF CURTIS & MARBLE MACHINE CO.
80 CAMBRIDGE STREET, WORCESTER 3, MASSACHUSETTS • PLeasant 5-3135

GREATER PRODUCTION with WAUKESHA Diesel POWER

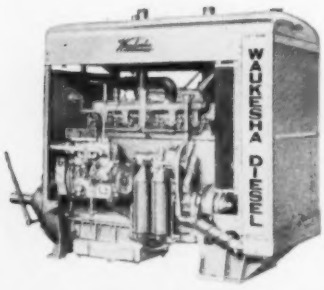
to 1235 hp Normal or Turbocharged



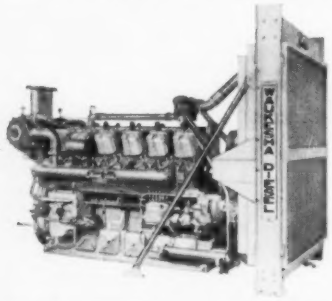
Model 148-DKBS—A typical turbocharged Diesel engine of medium size, 6 cyls., 779 cu. in. displ., approximately 280 max. hp.



Model 135-DKBM—426 cu. in. Marine engine. Waukesha Marine Diesels available up to 5788 cu. in. displ. and 990 24-hr. duty hp.

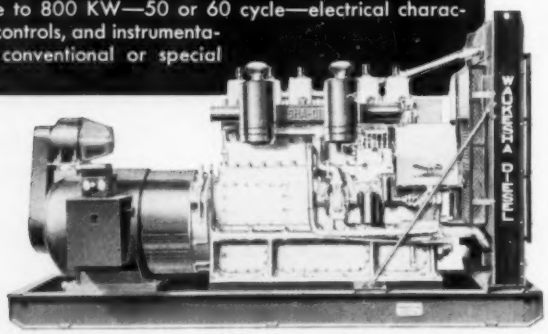


Model WAKDBU—A typical normally aspirated, medium size Diesel unit of 6 cyls., 1197 cu. in. displ. Develops approximately 260 hp.



Model VLRDBSU—Large V-12 turbocharged Diesel Unit—Develops up to over 1200 hp at 1200 rpm—5788 cu. in. displ.

Typical Waukesha Diesel Enginator (Engine-generator set). Available to 800 KW—50 or 60 cycle—electrical characteristics, controls, and instrumentation for conventional or special services.



X-103

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. • NEW YORK • TULSA • LOS ANGELES

NEW PRODUCTS . . .

Cleaning Agent Removes Fuel Oil From Electrical Equipment

The Navy has developed a cleaning composition that removes fuel oil from electrical equipment without harming insulation, metal, or humans. It also acts as an anti-rust agent.

Described in a recent report, the cleaner contains 4 components—hydro-carbon solvent, surfacant, penetrant and water. Used in combination with a water-displacing composition developed previously by the Navy, the new agent quickly cleans electrical equipment fouled with oil and sea water. Importantly, it is relatively harmless to electrical insulation, less flammable than fuel oil, non-corrosive, non-toxic and non-irritating to the skin.

An illustrated report covering this cleaner is available from OTS, U.S. Department of Commerce, Washington 25, D. C. It is entitled PB 151670 Salvage of Flooded Electrical Equipment. The price is 75 cents.

Gill Spark Arrestor Prevents Exhaust Spark Fires

Design of the Gill Spark Arrestor exceeds all test requirements of the U.S. Forest Service. Compliance with these requirements is mandatory under many Federal and local laws where internal combustion engines power equipment working in grass, stubble, brush and timber. These particular units are compact, fitting a 4-in. stack, and are primarily for use in oil field applications where a similar potential fire hazard exists. The new unit traps about 100% of the exhaust carbon. It is durable, and removing collected carbon is simple.

Proto Offers Selection of ⅜-in. Drive Metric Socket Wrenches

Supplementing the metric and Whitworth tools already available, Proto has a full selection of 12 sizes of metric socket wrenches in ⅜-in. drive. Set 5200 M contains 12 twelve-point sockets from 8 mm to 19 mm. Another set 5200ABM contains, in

addition to the 12 sockets, handles and attachments.

If you're working on any of the imported engines, or are getting your shop set up to handle them, you'll want to know more about these tools. The Reader Service Card will bring you complete data.

Metalset Tank Repairs Beat Moose Jaw Winter

British American Oil Co., Ltd. repaired crude oil storage tanks with Metalset, an aluminum-filled epoxy resin. It was used as caulking in multiple weep holes and large leaks.

Manufacturer, Smooth-On Manufacturing Co., reports that 90% of the tiny leaks stood up to the Moose Jaw Winter and the large leak was still 100% tight.

Taking into consideration the fact that small leaks may not have been entirely cleaned before application, Metalset did an excellent job. Both time and money were saved by avoiding the task of seal-welding. Next time your storage tanks start weeping or leaking better check on this method of repairs.

35-Ton Euclid-Easton Rear Dump Announced

GM's Euclid Division makes news with addition of a new variable wheel-base machine to its off-highway rear dump hauler line. This one is called the Model S-18. It consists of an overhung engine type tractor and an Easton-built semi-trailer.

Power flows from a GM 6-110 336-hp engine through an Allison 4-speed Torqmatic Drive with converter lock-up. Top travel speed with full payload, rated 70,000 pounds, is 25 mph.

Complete performance data and specs are available through our Readers Service Department.

2-SECOND DIESEL STARTS IN COLDEST WEATHER WITH QUICK-START

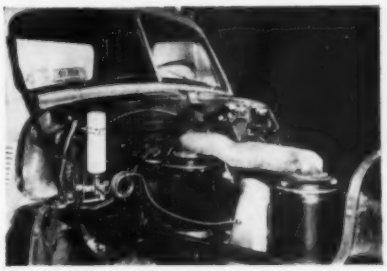
In cold winter weather, when work is tougher, and diesel operating costs go up, starting trouble is *expensive* trouble. QUICK-START solves cold-weather starting problems—safely and economically.

The QUICK-START System operates on a special ether-base mixture, designed to provide that extra "hot boost" that makes the difference in a cold diesel engine. Easily operated by one man, from the driver's seat, QUICK-START is activated by a special choke on the dash. One or two seconds of choking . . . a push on the starter . . . and the engine roars into action, in weather as cold as 0° F.

IN TEMPERATURES AS LOW AS −65°, QUICK-START provides the same safe starting action in only a few seconds longer, saves valuable time, fuel, and battery power.

Adaptable to All Types of Diesel Engines

Trucks • Tractors • Bulldozers
Buses • Mining Equipment
Farm Equipment • Cranes
Earth Movers • Marine Engines



Simple and inexpensive to install, the QUICK-START System requires no special tools or equipment, can be ready for operation in just a few minutes. Fuel tank and valves mount on fire wall, copper tubing is attached to the manifold with a tight brass fitting, choke is clamped to dash—and QUICK-START is ready for immediate use!

SPECIAL DISTRIBUTOR'S STARTING OFFER

Here is an unusual opportunity for distributors in the automotive, construction, and heavy-equipment fields with this popular, fast-selling system. Write, call, or wire Turner Corporation, Sycamore, Illinois, for complete information.

Quick-Start from Turner

TURNER CORPORATION • SYCAMORE, ILLINOIS

diesel power new literature

Technical Report on Regrinding Camshafts from Van Norman

This 8-page technical report gives the "how" and the "why" on regrinding camshafts. When should you regrind, install a new shaft, or just put back the old one without regrinding. Text gives you the technical factors which will help you make this decision. And just as important are the economic points discussed.

Seldom does an industrial publication give you as much solid information to back up its product story. Both work together in this publication making it a really meaty item. There's a list of Van Norman machine tools, some experience stories from users as a bonus. If you've been looking for the camshaft story our Reader Service Card will bring you this booklet.

A-C Engines and Generator Sets

Here is a 4-page bulletin on Allis-Chalmers' line of engines and generator sets. "Power for a Growing World" is the key line in this publication which gives a complete rundown on the A-C line. There are tips on selecting engines to suit the applications. Horsepower charts are related to the selection information, making this a valuable bulletin—one that can save users of this type of equipment a good deal of time.

If You Use Air Compressors . . .

Westinghouse has a 12-page 4-color bulletin on their unit compressors. Color photographs and cutaway drawings help describe "G" single-stage, "YS" single-stage and "YC" 2-stage compressors ranging in size from ½ to 15 hp and available in pressures from 80 to 250 psi.

In addition to a description of parts and accessories, specs list CFM displacements, pressures, weights, dimensions and rpm of the various models. Air receiver and auxiliary storage tank specs and dimensions are also covered.

Industrial Maintenance Equipment Catalog from OTC

Owatonna Tool Company has published a new catalog, 24 pages in two colors. "How to" keys the illustrations and descriptions of OTC pulling systems. Detailed are their Grip-O-Matic and Push-Pullers, Power-Twin "center hole" rams, pumps and hydraulic presses. How-to remove or install gears, bearings, pulleys, shafts and couplings with these OTC tools is told in this easy-to-read publication—a must item of shop files.

"Eliminating Explosions in Starting Air Lines"

Authored by Robert S. Ridgway of Standard Oil of California, this bulletin, published by Clark Bros. Co., is one people in the pipeline industry won't want to miss.

Standard Equipment on more diesel engines than any other make!

BENDIX STARTER DRIVES

Proved 125,000,000 times!

The long-time preference for Bendix* Starter Drives on diesel engines is based on hard facts such as these. It is simpler in design, it is more easily mounted—and in more positions. It requires no actuating linkage—therefore the solenoid can be placed in any convenient position. And it delivers performance, economy and durability far beyond any other drive. Whatever your type of diesel, it'll start *better* with a Bendix drive. *REG. U. S. PAT. OFF.

Bendix-Elmira
Eclipse Machine Division
Elmira, New York

Bendix
AVIATION CORPORATION

It presents latest findings on the mechanism of explosions in pipelines and compressor starting air lines. The nature of explosions and shock waves in piping are discussed and then related to compressor air starting systems. Preventive measures conclude the study. Ask for bulletin 173 from Clark Bros. on the Readers Service Card.

Starting of Diesel Engines at Low Temperatures

U.S. Army has released a report on techniques for operating diesels down to −65° F. Report PB 151676, by J. A. Klisch, may be ordered from OTS, U.S. Department of Commerce, Washington 25, D. C. The price is $1.25.

This 43-pager outlines existing problems, is based on both a survey of research papers and extensive Army experience. It covers preheating, fuel additives, priming aids, etc. High-speed cranking systems are reviewed as well. If your operation gets into really cold areas, there's a good deal of valuable information in this publication. Find out now, save time and trouble later.

Assembly and Run-in Lubrication

Acheson Colloids discusses the problems involved in machinery assembly and run-in operations and methods of overcoming them. As a manufacturer of industrial lubrications, their research in this field is very extensive.

The brochure outlines what happens internally in engines being broken-in, tells how Acheson colloidal lubricants can increase power, control wear, reduce oil consumption and run-in time, etc.

Entitled "Acheson Dispersions for Assembly and Run-In Lubrication" this publication will help you put these colloidal graphite and molybdenum disulfide lubricants to work, as well as serving as a reference source for this field.

"Heli-Call" Tells "Heli-Coil" Story

Heli-Coil Corporation has a publication, "The Heli-Call," which is devoted to this new technique in thread engineering. Applications tell the story of the success of Heli-Coil thread inserts. The reader can relate these applications to his own operation—may find that these inserts can save him time, money and trouble.

Also available are 5 bulletins: "Screw Thread Insert Design Manual and Catalog"; "Screw Lock Insert Design Manual and Catalog"; "Military Design Manual"; "Shop Pack Thread Repair Bulletin" and "Potential Unlimited." For your copy, or copies, mark the Reader Service Card.

Compilation of Construction Equipment Rental Rates

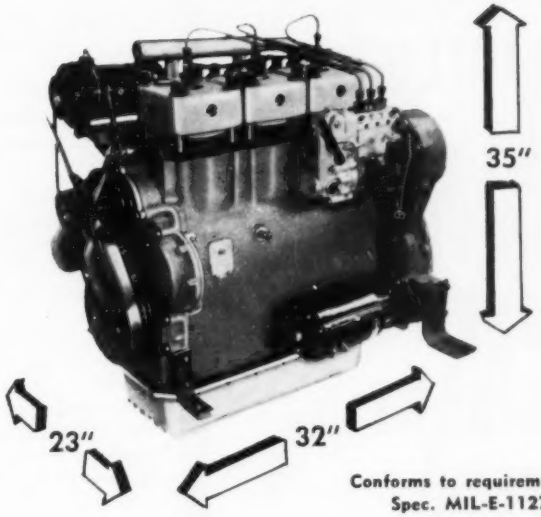
Associated Equipment Distributors have published their 1959 Compilation of Rental Rates. A moderate rate increase is reflected. This listing, based on a nation-wide survey, hits national average rates. Certain types of equipment are down from last year. You can get the full picture from the new green book.

Copies may be obtained, at $6.00 each from the AED, 30 East Cedar St., Chicago 11, Ill.

CERLIST DIESEL

MODEL 3

AUTOMOTIVE • INDUSTRIAL • MARINE



Conforms to requirements of Spec. MIL-E-11276

● WEIGHT 600 LBS.

● 85 HP AT 3000 RPM

● 75 HP AT 2800 RPM

● 65 HP AT 2600 RPM

Cerlist Diesel, INC.
BURLINGTON, NORTH CAROLINA

PRODUCERS OF LIGHT WEIGHT, HIGH SPEED DIESEL ENGINES

NEW LITERATURE . . .

IH's TD-6 Features

Here's a new bulletin on International's TD-6 crawler tractor. This unit has 42.3 drawbar-hp and a 5-roller track frame with a 4-roller frame optional. Standard transmission has 5 forward and 1 reverse speed. Optional is a 4-forward and 2-reverse speed transmission.

Other features include push-button start, new track rollers that need lubrication only every 500 hours. But there are many more. The 2-color, 16-page catalogue gives you the whole run-down. It's available through the Readers Service.

Application of Microbon Filter Elements Discussed

A brochure from Bendix Filter Division covers application of Microbon elements in various liquids and gases, including hydraulic oil, gasoline, air, lubricating oil, water, kerosene and fuel oil, plus others.

Packed with solid information, well illustrated with photographs, drawings, curves and tables, this 2-color brochure does a good job of telling the story of this new filter media. It covers the principles of filtration and cleaning techniques. Flow rate data is presented in a series of graphs. When you are ready to order, standard sizes and tolerances are listed on the back page.

MAXIM MEANS EFFICIENT HEAT RECOVERY PLUS RESIDENTIAL TYPE SILENCING

In a single packaged unit, Maxim Heat Recovery Silencers do the job of both boiler and silencer. This saves the cost of installing two separate pieces of equipment, conserves valuable space, and minimizes back pressure.

Because Maxim equipment operates either wet or dry, your diesels can run continuously even if waste heat is used only intermittently. Highly efficient for recovery of waste heat, Maxim Heat Recovery Silencers combine this with the optimum in noise suppression—of special importance in populated areas.

Maxim offers the most complete line available—vertical and horizontal models for a wide range of conditions and capacities. Send coupon for full information.

EMHART MANUFACTURING COMPANY
MAXIM DIVISION
BOX 216, HARTFORD 1, CONN.

EMHART

193

Emhart Manufacturing Company
Maxim Division
Box 216, Hartford 1, Conn.

Please send bulletin on Maxim Heat Recovery Silencers.

name

company

address

Euclid Puts C-6 Tractor Into Production

A new concept in design, Euclid's big new C-6 tractor has gone into production at the Hudson, Ohio plant. It boasts 211 net hp; a Torqmatic Drive consisting of torque converter and semi-automatic transmission that eliminates the master clutch. A rear-mounted cooling system is said to result in cleaner operation, frees front end for close mounting of attachments.

You can get the full story on the new C-6 by filling in the Readers Service Card.

Kiene's Portable Injector Tester and Hardware for Locomotive Engine Applications

Data sheet describes kit designed to test holder and nozzle assemblies, and injector assemblies, on the engine. Tester is for use primarily on engines using the inward opening, or popping type nozzles.

Detailed instructions cover these engines: Alco 244, Alco 539, Baldwin 600, Baldwin VO series, Baldwin-Lima-Hamilton and Alco 251, EMD and Budd 110 GMC, list adapters and test procedures.

This portable unit, making possible testing on the engine, is a real time-saver. You'll want these data sheets for your file.

You can get FREE information on products and services you read about in DIESEL POWER through the Readers Service Department

NEWS SECTION . . .

(*Continued from page* 15)

Teflon Bearings Go 50,000 Miles Without Lubrication

Teflon TFE fiber bearings have run 50,000 miles in ball-joint suspensions and steering linkages with no chassis lubrication. This Dupont product promises a big step in the development of a chassis which requires no lubrication, a design goal automotive engineers have had in their sights for some time.

With the ever-growing application of diesels in vehicles, this is a new wrinkle worth watching. If you are wondering about applications in your field, drop us a note on the Readers Service Card and we'll find out about it.

New Turnpike Projects Get Backing

Truck manufacturers are watching with keen interest as toll road bonds come back in style. Prices of outstanding turnpike issues are rising and the result has stimulated interest. Big deals that will require heavy financing are being considered and bond dealers are optimistic.

One reason for this upturn is that turnpike revenues are climbing sharply and this in the face of a generally tight money situation.

Truck use of turnpikes is up as the toll road people are wooing the industry. Tandem tests have made a strong following and this looks like a promising market for the future. Kansas is about to make tests, and other states are expected to follow suit.

We aren't going to return to the feverish boom of the 1953-54 era, but look for continued upswing in both planning and investing.

Worthington to Supply Most Major Mechanical Equipment to CIA Building

The new multi-million dollar Central Intelligence Agency building at Langley, Va. is due for completion in 1961. Worthington Corp. will have supplied most of the major mechanical equipment.

Included are two 2000-kw diesel engine generator standby units. Other equipment includes refrigeration and associated equipment as well as some steam turbines.

Worthington was awarded the contract because of its ability to serve as a single source of equipment on a complex job, according to the mechanical contractor, Lloyd E. Mitchell.

Detroit Diesel Mobile Service School Premieres at Clayton

Detroit Diesel's truck contained classroom was introduced at the Clayton Manufacturing Company's El Monte, California plant. Sponsored by Detroit Diesel's Los Angeles distributor, Anderson-O'Brien, classes extended over a period of two weeks.

Preventive maintenance and service techniques are taught by Service Training Representatives from Detroit Diesel's Product Service School. Distributor personnel and fleet operators attended.

During sessions on engine testing and horsepower analysis, Clayton Chassis and Engine Dynamometers were used.

Detroit Diesel now has three such mobile schools in various parts of the country, assigned on a regional basis. Training programs are arranged through local distributors to accommodate users of Detroit Diesel equipment.

The World's Leading Manufacturers of
FUEL INJECTION EQUIPMENT
for Diesel Engines

Depots and Service Agents in over 100 countries.

C.A.V.

FUEL INJECTION EQUIPMENT DIVISION OF
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Branch Offices: 643 7th Street, San Francisco, California
4937 West Belmont Avenue, Chicago 41, Illinois
400 South Edgewood Avenue, Jacksonville, Florida
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Joseph Lucas (Canada) Ltd. *Head Office:* 11 Davies Avenue, Toronto 8, Ontario
Branch Office: 3401 St. Antoine Street, Montreal 30, Quebec

AP 903

D.P.S. THERMOMETERS

These instruments are a series of marine type thermometers designed for all diesels and all plant uses—water or oil.

FEATURES All brass construction, nickel finish, cork insulation.

(Repair service available)

No. 416H	No. 426F
◀ Price ▶	
$6.75 ea	$5.70 ea

40 years continuously in the diesel engine business.

Write for catalog.

DIESEL PLANT SPECIALTIES CO.
Box 316
Stevens Point, Wisconsin

Diesel Engine Sales — Old line company with dynamic new sales program has several territories open for district sales managers. If you like a challenge and are willing to work write, in confidence, to R. H. Sheppard Co., Hanover, Penna.

PEOPLE AND PLANTS

(*Continued from page* 17)

EMSA Secretary Dies

Ira Solon Shull, age 66, died while touring the South Pacific with his wife. A retired tire engineer, long and prominently associated with the tire industry as well as in heavy construction work, he served as Secretary of the Equipment Maintenance Supervisors Association from its inception.

He figured prominently in the organization and growth of EMSA, adding many new friends to an already imposing roster. His wisdom and experience will be hard to replace.

Gold in Them Thar' Ideas

Harrison Radiator Division of GM announces that more than $1,000,000 has been awarded to its employees for suggestions submitted through the GM Employees Suggestion Plan.

The value of this plan, inaugurated in 1942, to both Harrison and its employees is pretty obvious from the figures. It represents an outstanding example of how employee participation in the improvement of a company's product can really pay-off for both.

Do you have a suggestion plan?

SALES NOTES . . .

New General Sales Manager for Utica Division of Curtiss-Wright

Clyde C. Williams now fills the post of General Sales Manager for Utica Division of Curtiss-Wright Corporation. He joins the firm after 31 years with the Chrysler Corporation where he served in many sales positions, the last being Vice President of sales for the Marine and Industrial Division.

Pedrick Announces Appointment of McGinley as Sales Manager

Pedrick has appointed Edward C. McGinley as Sales Manager of the Automotive Replacement Division. Mr. McGinley joins the piston ring

WASTING COSTLY FUELS?

For diesels of *ALL* sizes . . .

POWER-PAL SAVES UP TO 10%!

With *POWER-PAL*, a *concentrated* diesel fuel conditioner, fleet owners report improved engine performance, important fuel savings up to 10%. High diesel maintenance costs drop sharply as *POWER-PAL* keeps fuel injectors clean, dissolves harmful varnishes and moisture, and reduces engine deposits. For the money-saving answer to your diesel fuel problems, choose POWER-PAL!

POWER-PAL

Remember . . . Power-Pal is not an ordinary diesel fuel additive. It is a CONCENTRATED DIESEL FUEL CONDITIONER!

For your FREE sample of *POWER-PAL*, send this ad to:

MOTIVE SPECIALTIES DIVISION
Dept. DP
Nutmeg Chemical Company
130 HAVEN STREET,
NEW HAVEN, CONN.

STATEMENT OF THE OWNERSHIP, MANAGEMENT AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233)

State of Connecticut } ss.
County of Fairfield }

Of DIESEL POWER published monthly at Kutztown, Pennsylvania, for October, 1959.

1. The names and addresses of the publisher and editor are: Publisher, G. Renfrew Brighton, 80 Lincoln Avenue, Stamford, Conn., Editor, Brian P. Emerson, 80 Lincoln Avenue, Stamford, Conn.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)
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3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state).
None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bonafide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

DIESEL PUBLICATIONS, INC.
JAMES E. JONES, President

(Signature of editor, publisher, business manager, or owner)

Sworn to and subscribed before me this 22nd day of September, 1959
PAUL GUTHMAN, Notary Public
State of Connecticut No. 12039
Qualified in Fairfield County
(SEAL) Certificate filed with Fairfield County Clerk
Commission expires April 1, 1962

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If you would like further information on subjects advertised, new products described or new literature offered

or

if you would like to have us locate information on products or services not currently appearing in

diesel power

you have only to indicate your requests on these postage free post cards

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HAVE DIESEL POWER SENT TO YOUR HOME

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Are You Reading YOUR OWN PERSONAL COPY of Diesel Power?

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◄ ◄ ◄ ***MAIL THIS HANDY CARD TODAY — to start DIESEL POWER on its way to you.***

SEND NO MONEY NOW-
we'll be glad to bill you later

manufacturer after 14 years with The Thermoid Co. He brings long experience in sales to his new position. Pedrick feels that this phase of their sales program is one which offers great opportunities for expanded volume and profits for its shops and jobbers.

● John W. Pennington has been appointed general manager of the piston ring and seal department of Koppers Metal Products Division.

● Clark Equipment Co. has named P. E. Campbell head of sales to the transportation industry. Special sales group has been established to coordinate sales of materials handling equipment to this field.

● R. S. Bowie has been promoted to sales manager—Oil and Gas Industry at Cummins . . . emphasizes Cummins' increased interest in domestic and international oil field markets.

Expansion . . .

● Napier has a new subsidiary to handle growing business in Canada. The new firm will be known as Dr. Napier & Son (Canada) Ltd. and will headquarter at 4104 St. Catherine Street, West, Montreal.

● American Marc has three new eastern distributors who will be handling sales and service for the full line of American Marc diesels and diesel generator sets. New distributors are Allied Diesel Sales and Service, Inc. in Boston; Harbor Supply Oil Co. Inc. in Portland, Maine; Scranton Tractor and Equipment Co., Scranton, Pennsylvania.

● Golten Marine Co. of Brooklyn, N. Y., has been appointed service representative on the East Coast for M.A.N. engines. The primary function of the new facility will be to provide a Service Depot for M.A.N.'s marine diesels.

● Roper Hydraulics, Inc. continues its progress as their appointment as sales representatives for the Sherwood line of pumping equipment is announced. Roper will now be able to cover a wider range of applications.

● Euclid's 5th manufacturing facility in the greater Cleveland area has gone into production on two crawler tractor models. Plant is located on a 400-acre site in Hudson, Ohio.

● Pennsylvania Flexible Metallic Tubing Co. is putting up a new plant on the Lincoln Highway near Paoli, Pennsylvania. It will produce ferrous and non-ferrous metals, corrugated and interlocked flexible metallic tubing of all types and expansion joints.

● AiResearch Industrial Division has plans for a 10,000-sq ft addition to its present production facility. New receiving and storage building will be added adjacent to the machining area and provide a straight-through flow of materials used in production.

● But a small report on the current work and planned expansion in our industry, this section is a good indication of the health of the diesel industry and the industries which serve it.

REDUCE LAPPING TIME TO A *Minimum* ON

Diesel Injector and Compressor Parts

LAPMASTER Model 10

Consistently laps to flatness within .0000116" and finishes of 2 to 3 RMS.

No down time for truing lap plate . . . conditioning rings automatically keep plate flat and true.

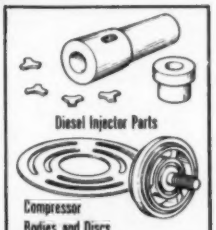
Handles parts up to 7" dia. . . . any shape or form . . . any metal, ceramics or plastic.

Automatically controlled lapping cycle.

Write for latest Lapmaster Bulletins

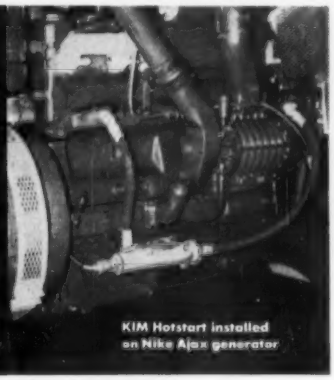
CRANE PACKING COMPANY

6448 Oakton Street, Morton Grove, Illinois, *(Chicago Suburb)*
In Canada: Crane Packing Co., Ltd., Hamilton, Ont.



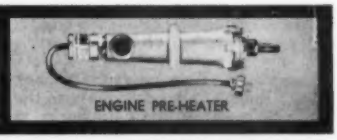
Grooved lap plate permits lapping of compressor bodies without removing stud.

KIM HOTSTARTS keep U.S. NIKE AJAX on all-weather ALERT!

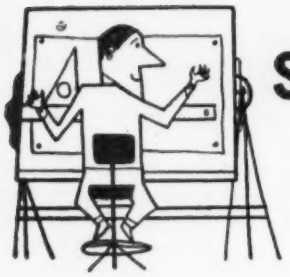


When efficiency is measured in split seconds, "cold starts" must be eliminated. That's why Nike Ajax are now equipped with KIM Hotstart engine pre-heaters. Regardless of weather, they enable operation under full load within seconds. For details on KIM Hotstarts, see your automotive dealer or write us for free literature.

KIM Hotstart



KIM HOTSTART MANUFACTURING CO.
West 917 Broadway Avenue P.O. Box 42 Spokane 10, Washington



service section

Recent engine and equipment modifications, procedures and recommendations straight from the different manufacturers to you

Fill Cooling System COMPLETELY

Detroit Diesel gives a timely word of advice in their "Service Topics" on the subject of draining and refilling cooling systems. In substance it is "Get all the air out of your cooling system."

Why? For a full rundown on the harmful effects of aeration see "Overheating/Undercooling," DIESEL POWER, August, 1959. Basically air in the cooling system interferes with heat transfer and promotes oxidation and corrosion.

Air is carried into the system during refilling in the form of bubbles. It prevents a complete fill and collects in the upper passages when the unit is put in operation. With less than normal water to start with, the trapped air will expand when heated and displace liquid needed for cooling. It can force by pressure caps and out the overflow if pressure builds enough.

GM recommends that the system be vented at least twice during early engine operation and again when the engine reaches operating temperature. Repeat after 30 to 40 minutes, in fact, it's a good idea to vent periodically to keep the system purged.

When the air is all out, fill to the proper level (within 2-in. of the filler neck) while the water is at operating temperature. It will be lower when cold, but do not overfill as this space is required for expansion.

SAFE
DEPENDABLE GENERATOR OPERATION
Spark Free!
EXPLOSION RESISTANT
KATO
Adaptable To Any Industrial Engine!
Kato's complete line of 50, 60 and 400 cycle revolving field AC Generators is now available in brushless design.
Especially desirable for operation in gaseous environments.
GREATLY REDUCED MAINTENANCE!
KATO BRUSHLESS AC GENERATORS
60 CYCLE SIZES
3 Phase: 5 to 400 KW
1 Phase: 5 to 150 KW
SPEEDS
720, 900, 1200, 1800 RPM.
Take your choice throughout the Kato Line—Brushless or standard slip ring types. For all your 400 cycle or power converting needs investigate Kato's complete line of high frequency alternators and motor generator sets. Complete control systems for all Kato products include Kato magnetic amplifier voltage regulators, static exciters and motor starters for synchronous or induction motors.
NEW BRUSHLESS GENERATOR CATALOG
Write For It Today!
KATO
ENGINEERING COMPANY
Builders of Fine Rotating Electrical Machinery Since 1928!
1408 FIRST AVE., MANKATO, MINN.
PHONE 8-2941

Overheard at a Truck Stop . . .

We stopped to get coffee early one morning on the road. Two truckers were at the counter.

"Coming over the hills she wouldn't pull the hat off your head. I figured she wasn't getting any air. When I looked at the filter element, it was pretty well gummed up. So I stuck some holes in it with a screw driver," one of the drivers was saying.

"Did it help?" asked his companion.

"Worked like magic. I come in here nice as you please. She's getting plenty of air now."

Sure she is . . . and plenty of dirt too. Punching holes in the filter cartridge is just as bad as pulling it out and throwing it away. Of the next fifty miles, twenty were under construction. Fine red dust filled the air. Plenty of it was going to get into this trucker's engine.

How much dirt does it take to ruin an engine? A couple of ounces will do the job. There is a simple moral to this tale.

First, driver education. It's up to the maintenance superintendent to instruct his operators—make sure they know why that air filter is there, what it does, and that it can save an engine.

Two, set up service periods so that this just can't happen.

Field Fuel Storage—Do it Right

It's just as easy to handle fuel oil properly and it will save you lots of grief. Here are tips culled from a number of reliable sources.

Location—Pick a spot that is (1) convenient to the equipment being serviced and (2) easily accessible by hard-surface road for supply trucks.

Protect drums or tanks—take precautions to prevent entry of dirt and water. For example, store drums horizontally so no rain collects on top.

Keep openings closed or if vented, use a good vent filter.

Protect against condensation—cover storage area when possible. This keeps out rain and protects drums or tanks from direct sun heat. This reduces temperature changes and hence the amount of condensation. Draw from one tank or drum until finished. Keeping maximum number completely full eliminates condensation in them. Also, fill equipment tanks at end of shift. This reduces condensation in fuel tanks as equipment cools down at night.

Allow for settlement—try not to use fuel from drums or tanks right after filling or moving. Give dirt and water a chance to settle. When stored horizontally, have back of tank or drum (away fom pump suction) lower than front so as to form a sump. If possible have a drain cock at sump.

Care for pumping equipment—keep pump, hose and nozzle as clean as possible. Use of filters in the line takes load off engine fuel filters, stretching their life, and is good insurance. Take pump suction an inch or so above tank or drum bottom. Don't try for the last gallon. If saving this fuel is important, collect a batch and give it special filtration and water separation before use.

None of these procedures are difficult. It's just a case of being aware of them and doing things right. It will pay off in protection of injection equipment, longer filter life and less downtime.

New approach to explosion relief valves (*Continued from page 40*)

and tested with remarkable success during the English experiments.

Summarizing . . .

As long as hydrocarbons are used to lubricate engines, the possibility of crankcase explosions exists. No matter how remote this possibility, it warrants the use of the most effective devices to protect both personnel and equipment.

The flap-type valve described, with its low mass and light spring loading, gives evidence of relieving explosion pressures rapidly and thus avoiding any significant pressure buildup in the crankcase. It closes with equal rapidity, effectively sealing the opening against an inflow of air. This prevents secondary and usually more serious explosions. Deflecting action of the valve, plus the use of screen flame traps eliminates flames and reduces noise.

Such protective equipment is good insurance but just that. Good preventive maintenance is still the best way to avoid the conditions leading to crankcase explosions and should not be relaxed because of the presence of protective devices. Make doubly sure and you'll have no troubles.

Inertia brakes eliminate double-clutching (*Continued from page 42*)

solution. If the engine won't slow rotation of the countershaft, main drive gear and clutch plate or plates, why not get synchronous speed for engagement by a brake? They came up with a brake system with an air-actuated multiple-disc brake at the front end of the transmission countershaft.

Operators get a break . . .

Operators are concerned with only one control—a pre-select valve. In using it he has only to observe a few simple "do's" and "don'ts":

1. Use only on up-shifts
2. Don't skip any ratios
3. Hold up briefly in neutral
4. Don't double-clutch

The whole idea was to make it easier on the operator. All he does is press the button on the pre-select valve, kick out the clutch, make his up-shift, waiting momentarily in neutral and then re-engage the clutch. The rest is done by the system.

How it works . . .

Pressing the pre-select valve with the transmission in gear, opens it and admits air to the trigger valve. This valve admits air to the brake and timer when the shift is made to neutral. The dual-valve setup provides the pre-selection feature. If the operator's valve admitted air directly to the brake, brake torque would make disengagement hard.

A trip mechanism protects the brake in case the operator throws a "quick shift" that beats the normal time cycle. It does this by opening the trigger valve when a shift is made to neutral and closing it on a shift into gear.

The multiple-disc brake works on a 0.2-sec time cycle during each application. The brake is exhausted at the end of this time and the pre-select valve is reset for further use.

A reset valve, actuated by a controlled pressure buildup from the timer, closes the pre-select valve and resets it for the next application.

Application . . .

Countershaft inertia brakes solve a specific problem—difficulty of up-shifting in cases where deceleration of heavy vehicles is faster than engine deceleration. It figures, then, that it is applied to Fuller transmissions for this service. This includes the "Roadranger" series and the 5-G-1220 heavy-duty, 5-speed unit of the "1220" series.

It will be included in new production of units such as the 5-G-1220 and "Roadranger" model R-1550 unit. Also, it can be applied as a modification to suitable existing transmissions.

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Situation: In 1938, when Garnett, Kansas put two diesel engines (one 600 hp and one 1000 hp) into service, plant management selected a Standard Oil diesel lubricant. In 1948, when a 1400 hp engine was added, the performance from the Standard lubricant caused management to make the same choice. In 1955, when a 2100 hp duel fuel unit was placed in service, STANODIESEL Oil M was chosen.

What has happened: At the Garnett plant, stuck rings and dirty pistons are unknown. The 1400 hp unit was in service nine years before reringing. Overhauls are made only every five years. The top performance from STANODIESEL Oil M and the technical service provided by lubrication specialist, J. D. Jenkins, have made possible first rate, uninterrupted, low cost electric service.

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Quick facts about
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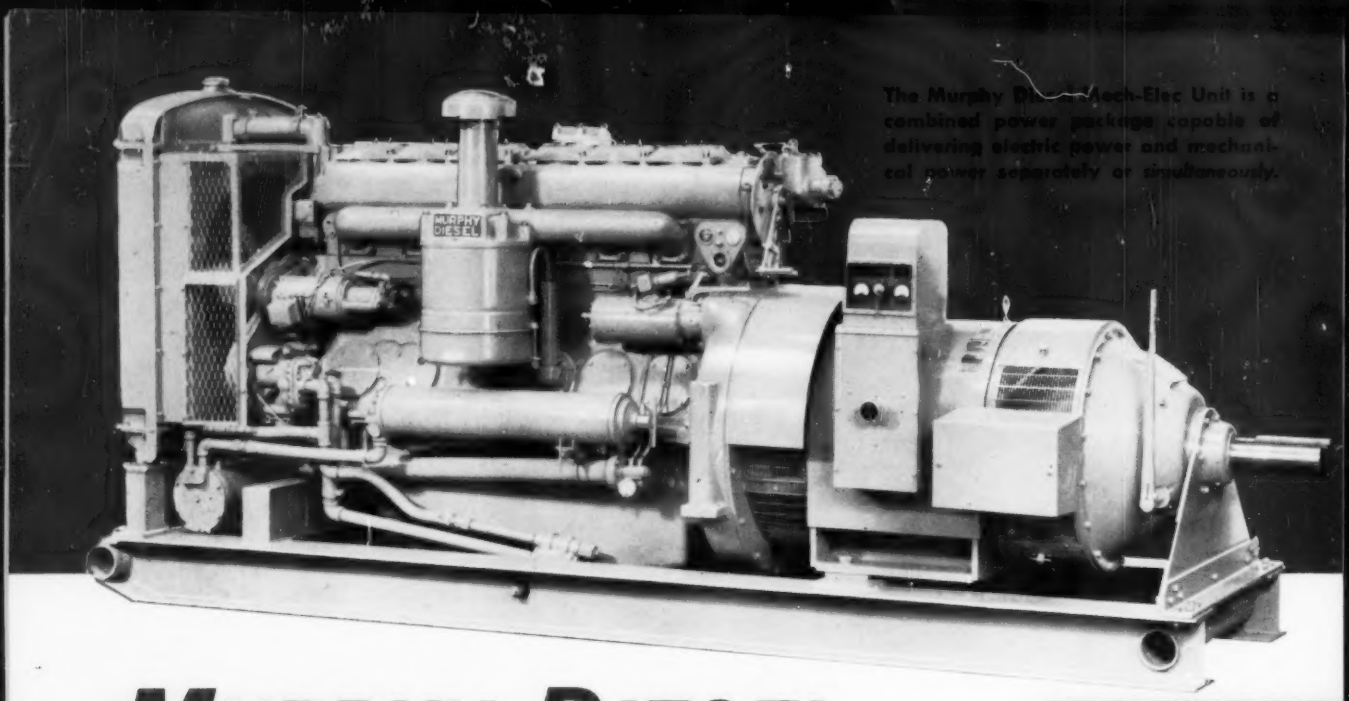
- Keeps crankcase, pistons, cylinder walls clean.
- Combats deposit and wear problems imposed by the use of economy fuels.
- Maintains film on difficult-to-lubricate parts.
- Eliminates fuel injector and pump sticking caused by deposits on injector barrel and plunger where fuel and lube oil mix.

Garnett plant superintendent John Watkins (left) and Standard Oil's J. D. Jenkins inspect light plant's 2100 hp unit lubricated with STANODIESEL Oil M. Jake Jenkins knows what he's talking about when he advises customers on lubrication. He's been doing this work for 13 years. He has an engineering degree from Missouri School of Mines, and he has completed the Standard Oil Sales Engineering School.



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Heavy-duty Oil Rings

At lower right is a cross section of a Sealed Power oil ring. It is a ventilated ring with narrow, tapered lands.

The taper exerts a scraping action, making this ring very efficient in controlling oil. Narrow cylinder wall contact area makes this a quick seating ring. Wide drain slots provide full oil drainage.

Sealed Power Piston Rings

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